

REPORT
OF
RAILROAD COMMISSIONERS
VERMONT
—♦—
1894

FOURTH BIENNIAL REPORT

OF THE

BOARD

OF

RAILROAD COMMISSIONERS

OF THE

STATE OF VERMONT,

June 30th, 1892, to June 30th, 1894.

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PART I.

COMMISSIONERS' REPORT.

BOARD OF RAILROAD COMMISSIONERS.

SAMUEL E. PINGREE, Chairman, Hartford.
AMORY DAVISON, Craftsbury.
LEON G. BAGLEY, Rutland.

ALFRED E. WATSON, Clerk, Hartford.

STATE OF VERMONT.

RAILROAD COMMISSIONERS' REPORT.

To the General Assembly of the State of Vermont :

The Board of Railroad Commissioners respectfully submits its Fourth Biennial Report.

The Vermont Central Railroad and the Connecticut and Passumpsic Rivers Railroad were chartered at the October session of the General Assembly, A. D. 1843.

Railroad construction began in Vermont in 1845, the first ground being broken at Windsor, on the 15th day of December of that year. The first rails were laid on the Colonel Nutt premises at White River Junction early in 1847.

The first passenger train of cars crossed the Campbell bridge over the Connecticut, entering this State at White River Junction and going north to South Royalton over the completed track to that point, on the 26th day of June, 1848.

The first regular running of trains on a completed track was up the White River to South Royalton, to which point the Vermont Central was formally opened, July 4th, A. D. 1848.

Within a few months from that, trains ran south to Windsor, and the Connecticut and Passumpsic Railroad was in operation northerly towards St. Johnsbury, and the Central Vermont line was being rapidly extended towards Burlington.

The next corporation to construct and open its line for traffic was the Rutland and Burlington Railroad Company, upon some parts of which, trains were running late in 1849.

The work of railroad construction developed in other parts of the State gradually, down to the completion of the Bristol Railroad in 1892, since which no work of original railroad

building has been done in Vermont, although a short spur line from the main line of the Barre Railroad has been completed to East Barre, a distance of 1.75 miles, within the last eighteen months.

There are now twenty-eight railroads located wholly or in part in this State, eighteen of which make annual returns to the Board, generally complying with the standard form of returns, which has become substantially uniform in its statistical requirements throughout the States of the Union where Railroad Commissioners or equivalent Boards exist.

Of this number of corporations, but seventeen are now engaged in the actual operation of their roads—the others having been leased to, or, under some other business arrangement, are operated by other railroad companies, except the Bennington and Glastenbury Railroad, which has ceased to be operated since the date of the last Biennial Report.

RAILROAD CONSTRUCTION.

The only new railroad construction in this State since the completion of the Bristol Railroad, January 5th, A. D. 1892, is the line from the Barre Railroad to East Barre, a distance of 1.75 miles, although there have been new sidings and spur tracks of small extent built on various roads, and 4.2 miles of second track between St. Albans and Swanton Junction.

THE PRESENT CONDITION OF RAILROAD BUSINESS AND ITS RELATIONS TO THE PUBLIC.

The railroad years ending June 30th, 1892 and 1893, were fairly prosperous years on all the lines of the State.

For the year from June 30th, 1893, to June 30th, 1894, an unprecedented change has come upon their business affairs, bringing upon them a period of general depression heretofore for many years unknown.

A great falling off in both freight and passenger traffic, with a corresponding decrease of gross receipts, has demanded and justified, as a matter of business necessity, a limited curtailment of expenses which the general public has appeared

to understand and recognize by a patient submission to a more limited train service and an abated zeal for the immediate enforcement of better station facilities and such transportation facilities and conveniences as are their right to exact in the normal period of prosperity in the railway business of the State.

The railway companies and the public should divide the burden of the depressed condition of railway traffic mutually, the one reducing its dividends to stockholders, and the other enduring for the time being such reasonable curtailment of transportation facilities as well-considered economics demand in the conduct of railroad business for the saving of actual loss and ultimate bankruptcy.

The prospect for the early increase of traffic on our trunk lines is believed to be improving since the close of the last railroad year.

The baseless besom of destruction which has swept over many of the great arteries of interstate and local commerce in the West, at the hands of the mob and the anarchist, has not directly visited itself upon the railway interests of the East, but, by indirection, has seriously affected the business and prosperity of all our through traffic railroads alike.

The general business and monetary depression in all the depths and shoals of commerce throughout the country has laid its heavy hand upon the railway interests, the largest and most closely affecting the public of all, with a similar disastrous effect that it has upon the manufacturing, mining and commercial lines of business life.

It suffers with them, and with their revival it will revive.

As indicative of the common consent of the people of the State to appreciate the effect of the general stress and depression of the times upon the railroad earnings for the last year, and their patient endurance of the diminished train service and facilities on several of our railroads, it may be stated that but a single complaint has come to the Board in relation to the subject in the past year.

This fact seems noteworthy as indicating the existence of a more appreciative and mutual relation between the people

of the State and their railroad corporations then has existed in years past.

In all the official relations of the Board to the railroad companies, it has found a recognition on their part of the fact that their corporations are amenable to the public, and the many evils which in former years had grown up in railroad operations and policies in their dealings with their patrons, which would not bear the exposure of a public investigation, have been abandoned, while at the same time the public has recognized their readier sense of fairness and justice and has become educated to concede what is practicable and reasonable.

This new condition of the relations now subsisting between the corporations and the public is believed to have been largely attained through the existence of a Railway Commission, and its usefulness in preventing abuses and in promoting the mutual relations and interests of the railroad companies and their patrons.

Although the recommendations of the Board are clothed with no legal force, they have thus far met with compliance on the part of the corporations and have been adopted as conclusive, the same as if they were supported by the power of the State.

COMPLAINTS, PETITIONS, INVESTIGATIONS AND INQUIRIES.

Many complaints and petitions have been presented to the Board at this biennial period for its consideration, and where not otherwise satisfactorily adjusted, sessions of public hearings have been held, after due notice to the parties interested in the matters complained of.

The full text of the action of the Board and its decisions on these complaints and petitions may be found in Part IV of this report.

Accident inquiries to the number of 54 have been made by one or more commissioners in the same period, and the testimony taken on preliminary inquiry has been considered and

passed upon at Board sessions, the brief details of which, with the conclusions of the Board thereon, are recorded, under the head of "Accident Inquiries," in Part III. In all these accidents no public investigation was deemed to be demanded in the interest of the public, there appearing to be no reasonable cause for believing that the same were the result of improper conduct or fault of the corporations through their servants or agents, or otherwise.

Whenever it has been found in these inquiries that the cause of the same might have been through the negligence, carelessness or other fault of the company or its road machinery, management of trains, or otherwise, public investigations have been ordered, and notice thereof has been given to all parties interested in the same, and the results of these investigations are reported under the head of "Special Reports on Accidents" in Part III of this report. These public investigations of accidents held in 1892 were eight in number, in 1893, eleven, and in 1894, eight, upon all of which reports were made public, and the same for both years are here made to the Legislature.

ACCIDENTS.

The total number of railroad accidents in the State, coming to the knowledge of the Board in the last two biennial periods, from all sources, was 258, and the number which involved loss of life or injury to the person was 137 in 1890-'92 and 114 in the last biennial term. The same are tabulated and classified as follows, viz.:

	1890-'92.	1892-'94.
Fatal accidents.....	63	56
Accidents not fatal.....	76	63
Total.....	139	119

The same divided into their three leading classes and showing the individual casualties are as follows, viz.:

PASSENGERS.

	1890-'92.	1892-'94.
Killed.....	0	8
Injured.....	42	33
Total.....	42	41

EMPLOYEES.

Killed.....	29	35
Injured.....	53	50
Total.....	82	85

ALL OTHERS.

Killed.....	33	18
Injured.....	17	22
Total.....	50	40

Of the latter class, 27 accidents to trespassers are included, 15 of which were fatal and 12 of which did not result fatally.

The number of accidents resulting in extensive damage to property, but unattended with loss of life or serious injury to the person, during the railroad years 1893 and 1894, is four. Three of these have been the subject of public investigation for the reasons stated in the report of the same in Part III.

The following tabulation of these accidents presents more in detail the various causes, and the classes of the victims of these accidents :

ACCIDENTS, JULY 1st, 1892, TO JULY 1st, 1893.

CAUSES OF ACCIDENTS.	PASSENGERS.		EMPLOYER.		OTHERS.		TOTAL.	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Highway crossings.....	..	2	..	..	2	6	2	6
Getting on or off trains or engines in mot'n	1	..	3	3	6
Falling from trains—engines or cars.....	11	6	..	..	11	6
Coupling and uncoupling cars.....	1	8	..	1	1	9
Struck by bridge.....	1	..	..	..	1
Falling of dump-car door.....	1	..	..	..	1
Hand-car struck by wild engine.....	2	1	..	..	2	1
Rear collision.....	1	..	..	..	..	..	1	..
Pushing cars on siding.....	1	..	1	..
Walking or being on truck.....	1	1	7	2	8	3
Derailements.....	1	9	..	2	..	..	1	11
Struck by water-tank spout.....	1	..	..	..	1
Head collisions.....	2	12	3	5	..	..	5	17
Caught between car and skid.....	1	..	..	..	1
Bursting of oil can.....	1	..	..	..	1
Crushed by falling stone.....	1	..	..	..	1	..
Side collision.....	1	..	..	..	1	..
Open switch.....	1	..	..	..	1	..
Attempting to pass between cars of train..	2	..	2
Totals.....	6	23	22	29	10	14	38	66

ACCIDENTS, JULY 1st, 1893, TO JULY 1st, 1894.

CAUSES OF ACCIDENTS.	PASSENGERS.		EMPLOYEES.		OTHERS.		TOTAL.	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Highway crossings.....	..	2	..	..	1	2	1	2
Getting on or off trains or engines in mot'n	1	..	..	..	1	2	2	4
Falling from trains—engines or cars.....	1	..	..	1	..	2	3	1
Coupling and uncoupling cars.....	1	3	..	..	1	3
Struck by bridge.....	2	..	..	..	2	..
Rear collision.....	..	2	1	..	..	3	1	3
Walking or being on track.....	..	2	2	3	5	..	7	3
Deraillments on road.....	..	1	2	..	..	..	2	5
Head collisions.....	7	..	..	..	6
Stealing ride on cars.....	1	..	1	..
Caught in coal pit.....	..	2	1	2	..	..	1	4
Collision with rock on track.....	1	2	..	..	1	2
Falling of bridge—Nulhegan.....	..	1	1	1	..	..	1	2
Switch deraillment.....	1	..	..	..	..
Caught between cattle drive and bridge to car.....	1	..	1
Totals.....	3	10	13	19	8	8	23	37

SUMMARY OF ACCIDENTS.

JULY 1, 1892, TO JULY 1, 1893.			JULY 1, 1893, TO JULY 1, 1894.		
Total Casualties.	Fatal.	Ratio Per Ct.	Total Casualties.	Fatal.	Ratio Per Ct.
All classes.....104	38	.365	All classes..... 60	23	.383
Passengers.... 29	6	.207	Passengers..... 12	2	.167
Employes..... 51	22	.431	Employes..... 32	13	.406
Other classes.. 24	10	.417	Other classes... 16	8	.500

SUMMARY OF ACCIDENTS TO TRESPASSERS.

JULY 1, 1892, TO JULY 1, 1893.				JULY 1, 1893, TO JULY 1, 1894.			
Killed.	Injured.	Total Killed and Injured.	Per Cent. Fatal.	Killed.	Injured.	Total Killed and Injured.	Per Cent. Fatal.
8	7	15	.533	7	5	12	.583

The following table and data, taken from the last Report of the Statistician to the Interstate Commerce Commission, present statistics which cannot fail to be of interest to the Legislature in connection with the subject of railway accidents.

COMPARATIVE SUMMARY OF RAILWAY ACCIDENTS FOR THE YEARS ENDING JUNE 30, 1893,
1892, 1891, 1890, 1889 AND 1888.

Year.	EMPLOYEES.		PASSENGERS.		OTHER PERSONS.		TOTAL.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
1893.....	2,727	31,729	299	3,229	4,320	5,435	7,346	40,393
1892.....	2,554	28,267	376	3,227	4,317	5,158	7,147	36,652
1891.....	2,660	26,140	293	2,972	4,076	4,769	7,029	33,881
1890.....	2,451	22,396	286	2,425	3,598	4,306	6,335	29,027
1889.....	1,972	20,028	310	2,146	3,541	4,135	5,823	26,309
1888.....	2,070	20,148	315	2,138	2,897	3,642	5,282	25,888

The number of railway employees killed during the year covered by this report was 2,727, being greater by 173 than those killed during the previous year. The number of employees injured was 31,729, being greater by 3,462 than the number injured the previous year. The increase in the number of employees during the year was 52,187. The number of passengers killed during the year was 299, being less by 77 than the number killed the previous year, and the number injured was 3,229, being 2 in excess of the number injured the previous year. The total number of passengers carried was 593,560,612 in 1893 as against 560,958,211 in 1892, being an increase of 32,602,401. Under the heading of "Other Persons" is included a statement of the number of persons killed and injured by railway accidents, who at the time of the casualty were neither employees nor passengers. It includes casualties at stations, highway crossings, and to trespassers upon tracks. The total number of deaths during the year on account of accidents to persons of this class in connection with railways was 4,320, and the total number injured was 5,435.

Referring to the statistics of accidents for the entire country, it appears that during the year covered by the report 1 employe was killed for every 320 men employed, and one was

injured for every 28 men employed. The most dangerous service is, of course, that of conducting transportation, and from the above statement it appears that 1 employe was killed during the year covered by this report for every 115, and 1 injured for every 10 men engaged in this branch of the railway service. A similar comparison for passengers shows 1 passenger to have been killed for every 1,985,153 passengers carried, or for every 47,588,966 passenger miles accomplished. The number of passengers carried for 1 injured was 183,822 and the number of passenger miles for each passenger injured was 4,406,659.

RAILROAD MILEAGE.

From the returns of the railway systems and the companies making their separate returns, as made to the Board, the total mileage of main line track and branches in this State, at date of June 30, 1894, is found to be 981.86 miles, including 18.09 miles of double track, and the mileage of sidings and spur track is 249.505 miles, showing an increase in the mileage of sidings and spur track of 20,135 miles in the last biennial period, with no increase of main line.

The foregoing summary is based upon the details of the following tabulation, collated from the returns of the railroad companies for the years 1892 and 1893.

RAILROADS.		Main Line and Branches in Vermont.	Sidings, etc., in Vermont.
Boston and Maine System.	Barre.....	9.26	10.74
	Bennington and Rutland.....	58.91	5.25
	Ashuelot.....	.72	1.69
	Connecticut and Passumpsic Rivers..	110.30	34.38
	St. Johnsbury and Lake Champlain (including Victory and Hardwick Branches, 11.1 and 1.5).....	132.60	18.42
	Vermont Valley.....	23.80	5.35
	Bristol.....	6.26	.56
Canadian Pacific System.	Newport and Richford.....	21.00	6.00
	Addison.....	15.60	1.75
Central Vermont System.	Brattleboro and Whitehall.....	36.00	3.50
	Burlington and Lamoille Valley.....	26.00	1.875
	Central Vermont (including 10.4 miles of second track).....	186.60	85.00
	Missisquoi Valley.....	28.00	3.50
	Montpelier and White River.....	15.00	5.50
	New London Northern.....	10.00	4.20
	Rutland.....	119.70	25.30
Delaware and Hudson System.	Clarendon and Pittsford (including Pittsford and Rutland, 1.78 mile)...	11.78	3.05
	Rensselaer and Saratoga.....	36.65	14.91
	Fair Ground.....	.59	.29
	Fitchburg, double track, 6.49 and 6.19 miles.....	12.68	1.92
Grand Trunk System.	Atlantic and St. Lawrence.....	30.56	5.75
	Hoosac Tunnel and Wilmington (in- cluding Branch, .75 mile).....	16.50	.23
	Lebanon Springs.....	5.92	.25
Maine Central System.	Upper Coös and Coös Valley.....	13.85	3.12
	Montpelier and Wells River (including 1.50 mile double track and Barre Branch, 3.80 miles, and 1 mile siding).	39.70	6.50
	Woodstock.....	13.88	.47
Total.....		981.86	249.505

ANNUAL RETURNS.

Sixteen railroad companies have made returns each of the last two years, in accordance with the prescribed forms, though not all have complied fully therewith, and such as have omitted to fill, in every detail, the blanks furnished them, when their method of accounting would furnish the same, have violated the law of the State, and have thereby, in some degree, detracted from the statistical value of the tables and statistical deductions here presented.

The progress towards perfection of these returns has been rapid, and but little additional painstaking on the part of the clerical force of certain companies is required to give reliable results in tabular deductions. The forms for these returns are generally uniform throughout the States. The imperfections have in the main been eliminated through the joint action of State and Interstate Commissions, looking to a more perfect uniformity of corporation returns of methods of railway accounting, and of uniformity of railroad law throughout the States and the country. The great variety and consequent confusion which resulted in the various methods of keeping railroad accounts in the different States, and by the different companies, in some instances, in the same State, have been mainly relieved through the action of the Interstate and State joint conferences at Washington in the past six years, and in the legislation which has been the result of the recommendations of said commissions to Congress and to many of the State Legislatures, ensuring a wider uniformity and harmony of laws upon many important matters.

DIVIDENDS.

The annual returns of the various railroad companies making report to this Board, show that the companies that have paid dividends either in the fiscal year 1891-92 and 1892-93, or in both years, are as follows, viz.: The Atlantic and St. Lawrence (leased to the Grand Trunk Railway Company), 6 per cent in 1892 and 1893; Connecticut and Passumpsic

Rivers (leased to the Boston and Maine Railroad), 5 per cent in 1892 and 1893; the Fair Ground, 5 per cent in 1893; the Fitchburg, 4 per cent on preferred stock in 1892 and 1893; Maine Central, 6 per cent in 1892 and 7½ per cent in 1893; New London Northern (leased to Central Vermont Railroad Company), 7 per cent until leased to the Central Vermont Railroad Company, in December, 1891, since which time it has paid 8 per cent—2 per cent quarterly, under the terms of the lease; Rensselaer and Saratoga (leased to the Delaware and Hudson Canal Company), 8 per cent in 1892 and 1893; the Vermont Valley (leased to the Boston and Maine Railroad), 6 per cent in 1892 and 1893; the Woodstock Railway Company, 1 per cent in 1892.

As to the leased railroads in the State, the Boston and Maine Railroad guarantees 5 per cent on the stock of the Connecticut and Passumpsic Rivers Railroad Company for 10 years from 1887, and 6 per cent for 89 years thereafter; the Central Vermont Railroad Company pays a yearly rental of 4 per cent on the stock of the Missisquoi Valley Railroad Company, and 5 per cent on the stock of the Burlington and Lamoille Valley Railroad Company, for the roads of these respective companies, and \$345,000.00 for the Rutland Railroad. Under the terms of their respective leases, the Addison Railroad Company receives 7 per cent on its cost, and the Brattleboro and Whitehall, \$12,000 yearly. The Delaware and Hudson Canal Company guarantees 8 per cent in perpetuity on the capital stock of the Rensselaer and Saratoga Railroad Company for its road, and the Central Vermont Railroad Company pays for the New London Northern Railroad an annual rental of \$210,000.

The fact of the payment of any interest on the stock of the above named leased lines is largely accounted for by the existence of the contracts of lease above named.

CAPITAL STOCK, BONDS, LIABILITIES AND COST OF ROADS AND
EQUIPMENT, AND COST AND INDEBTEDNESS PER ROAD MILE.

The table following this heading presents the amount of capital stock, outstanding bonds, current liabilities and cost of the equipment of the several railroads operating wholly or in part within this State for the year 1893, together with cost and indebtedness of the same per mile.

1893.

RAILROADS.

	Capital Stock.	Bonds Outstanding	Current Liabilities.	Cost of Road and Equipment.	Includedness per Mile of Road	Cost of Road per Mile.
Atlantic and St. Lawrence—leased to Grand Trunk Railway Company	\$5,484,000 00	\$3,488,000 00		\$8,922,000 00	\$54,000 73	\$54,000 73
Barre	75,223 10	None.	307,838 32	290,421 36	30,570 34	29,052 23
Bennington and Barland	1,000,000 00	475,000 00	20,815 11	1,475,000 00	25,038 20	25,038 20
Bristol	100,000 00	100,000 00	665 31	200,000 00	31,948 88	31,948 88
Central Vermont	1,000,000 00	No report	1,670,157 69			
Clarendon and Pittsford	60,000 00	None.	149,123 07	170,392 57	17,732 38	17,030 25
Connecticut and Passumpsic Rivers—leased to Boston and Maine Railroad	No report					
Fair Ground	4,000 00	3,000 00				
Fitchburg	24,000,000 00	30,490,500 00	2,875,045 89	42,502,525 17		
Hosac Tunnel and Wilmington	250,000 00	None.	234,124 27	453,144 16	18,535 08	18,405 68
Lebanon Springs	2,000,000 00	530,000 00	22,074 08	No inform'n	in Receiver's hands.	
Maine Central	4,374,700 00	10,592,300 00	1,101,832 22	14,005,820 94	38,079 40	44,858 29
Montpelier and Wells River	800,000 00		74,534 30	800,000 00		
New London Northern—leased to Central Vermont Railroad Company			Assumed by So. E. Ry. Co.			
Newport and Richford—operated by Canadian Pacific Railway Company	350,000 00	350,000 00		No inform'n		
Rensselaer and Saratoga—leased to the Delaware and Hudson Canal Company				2,967,194 14		15,470 00
St. Johnsbury and Lake Champlain—operated by Boston and Maine Railroad	3,848,500 00	641,000 00	1,397,283 26	4,784,765 23	44,708 60	30,386 61
Vermont Valley—leased to Boston and Maine Railroad	1,000,000 00	400,000 00	100,315 85	1,677,216 68	79,179 83	44,884 01
Woodstock	250,000 00	None.	3,890 97	267,325 00	18,011 52	19,295 74
Totals	\$45,197,323 10	\$36,918,800 00	\$7,825,221 35	\$77,982,005 20	11,809,118 98	11,830,440 08
			Average		\$35,647 18	\$30,596 25

* Cash Assets—Balance. † Receiver's certificates.

From the foregoing table it appears that the average cost of road per mile, as above returned, is \$30,586.28; the average cost of road and equipment is \$38,046.84 per road mile, and that the average indebtedness of road per mile is \$35,647.18.

And also from the returns of those railroads which give the amount of their capital stock, outstanding bonds and current liabilities, the following facts appear, viz.:

The amount of capital stock is \$45,197,323.10; amount of outstanding bonds, \$36,918,800.00 and the amount of current liabilities is \$7,865,221.35.

It will be noticed that the foregoing table and deductions therefrom include figures applying to both standard and narrow gauge railroads of the State.

COST OF ROAD PER MILE.

Of the 981.86 miles of main line steam railroad in this State, all but 52.50 miles is of the standard gauge, 4 feet 8½ inches.

The Brattleboro and Whitehall Railroad, from Brattleboro to South Londonderry, 36 miles, is of 3 feet gauge, and the Hoosac Tunnel and Wilmington, from Massachusetts line to Wilmington, 16.50 miles, is of the same gauge, the same being the only narrow gauge track roads in the State. The average cost of construction of the nine standard gauge railroads reporting separately upon this subject, as deduced from the returns of these companies for 1893, is \$34,787.76 per mile of road owned or operated by the companies returning the data, and the average cost of same per mile of road for equipment, eight roads reporting, is \$5,541.45, making the average cost per mile of the standard gauge road, with its equipment, \$40,329.21.

The average cost of the narrow gauge roads, as per returns for the same year, is \$13,063.67 per mile, and its equipment \$2,090.56 per mile, making the average cost per mile of this class of road, with its equipment, \$15,154.23.

The following table is presented, showing statistical data of interest to the Legislature in this connection:

RAILROADS.	Total Cost Equipment To June 30, 1893	Total Cost Construction To June 30, 1893.	Cost per Mile.
Atlantic and St. Lawrence, (leased to Grand Trunk Railway Co).....		Including) Equipment - \$8,922,000 00)	\$54,000 73
Barre.....	\$48,692 09	217,729 17	Con..... 23,773 90 Equip.... 5,258 33 Total.. \$29,032 23
Bennington and Rutland.....		1,475,000 00	25,038 20
Bristol.....		200,000 00	31,948 88
Clarendon and Pittsfd	31,186 52	139,206 05	Con..... 13,920 60 Equip.... 3,118 65 Total.. \$17,039 25
Delaware and Hud- son Canal Co..... Rensselaer and Sara- toga.....	2,791,723 44	*175,470 70	Con..... *\$914 61 Equip.... 14,555 39 Total.. \$15,470 00
Hoosac Tunnel and Wilmington.....	51,218 85	401,925 31	Con..... 16,405 11 Equip.... 2,090 56 Total.. \$18,495 67
Fitchburg.....	3,946,940 47	38,555,784 70	Con..... 85,618 62 Equip.... 8,764 74 Total.. \$94,383 36
Maine Central.....	2,119,801 36	11,976,019 58	Con..... 38,112 27 Equip.... 6,746 02 Total.. \$44,858 29
St. Johnsbury and Lake Champlain.....	151,567 53	4,663,197 70	Con..... 35,233 44 Equip.... 1,152 60 Total.. \$36,386 04

*These figures only cover the construction account of the Delaware and Hudson Canal Company, lessee of the Rensselaer and Saratoga Railroad, as reported by said company to this board. The actual cost of construction of the Rensselaer and Saratoga Railroad is \$11,649,553.13 or \$60,738.02 per mile of road.

RAILROADS.	Total Cost Equipment To June 30, 1893.	Total Cost Construction To June 30, 1893.	Cost per Mile.
Vermont Valley.....	82,838 87	994,377 76	Con..... 41,432 40 Equip.... 3,451 64 Total.. \$44,884 04
Woodstock.....	17,825 00	250,000 00	Con..... 18,011 52 Equip.... 1,284 22 Total.. \$19,295 77

PASSENGER REVENUE AND FARES,

The total number of passengers carried upon all the railroads wholly or partly within the State for the year 1892 was 14,838,800, and for the year 1893, 15,961,873.

The total passenger revenue for 1892 was \$6,939,232.64, and the same for the year 1893 was \$7,237,599.27.

The average receipts per passenger per mile for the year 1892 was \$0.02742, and the same for the year 1893 was \$0.02776.

The average estimated cost of carrying each passenger per mile for 1892 was \$0.02205 and for 1893 the same average was \$0.02203.

The following tables, collated from the railroad returns, present the number of passengers carried, total passenger revenue, the average amount received from each passenger per mile, with the estimated cost of transportation for each per mile, upon the several railroads therein specified, as per their respective returns to the Board, for the years 1892 and 1893.

1892.

RAILROADS.	Number of Passengers Carried.	Total Passenger Revenue.	Average Receipts per Passenger per Mile.	Estimated Cost of Carrying each Passenger per Mile.
Atlantic and St. Lawrence (leased to Grand Trunk Railway Company).....	358,388	\$208,955 91	2.550	.....
Barre.....	12,100	2,722 05	5.625	.....
Barnington and Rutland.....	233,829	122,315 59	2.423	.....
Bristol.....	Not given.	.....	.....	.....
Central Vermont.....	1,467,232	.....	2.100	1.700
Clarendon and Pittsford.....	None carried for revenue.	.....	.....	.....
Connecticut and Passumpsic Rivers (leased to Boston and Maine Railroad).....	409,125	346,051 98	2.067	1.731
Fair Ground.....	No account kept.	.....	.....	.....
Fitchburg.....	7,342,081	2,104,154 15	1.920	1.438
Hoosac Tunnel and Wilmington.....	25,616	8,807 84	3.312	2.068
Lebanon Springs.....	65,150	20,339 49	3.000	3.728
Maine Central.....	2,088,573	1,953,779 05	2.370	1.665
Montpelier and Wells River.....	167,342	53,634 14	2.492	2.703
Newport and Richford (operated by Canadian Pacific Railway Company).....	95,500	26,574 50	1.577	2.093
Rensselaer and Saratoga (leased to Delaware and Hudson Canal Company).....	2,249,419	883,701 95	2.368	1.796
St. Johnsbury and Lake Champlain.....	150,976	74,734 34	2.421	3.692
Vermont Valley.....	126,309	88,352 30	3.280	2.343
Woodstock.....	17,219	10,715 46	3.081	1.507
Total.....	\$14,838,800	\$6,939,232 04	41.136	26.454
Average for all roads.....	.....	.....	2.742	2.205

1893.

RAILROADS.

	Number of Passengers Carried.	Total Passenger Revenue.	Average Receipts per Passenger per Mile.	Estimated Cost of Carrying each Passenger per Mile.
Atlantic and St. Lawrence (leased to Grand Trunk Railway Company).....	418,644	\$319,340 66	Cents. 2.944	Cents. Not given
Baer.....	15,105	3,381 90	5.594	" "
Bennington and Rutland.....	221,896	111,931 59	2.710	" "
Bristol.....	No report.	.....	.....	.....
Central Vermont.....	1,594,804	909,337 54	2.250	1.890
Clarendon and Pittsford.....	Freight	road only.	.....	.....
Connecticut and Passumpsic Rivers (leased to Boston and Maine Railroad).....	470,412	376,447 84	2.051	1.502
Fair Ground.....	No record	kept.	.....	.....
Fitchburg.....	7,770,632	2,204,581 97	1.809	1.550
Hoosac Tunnel and Wilmington.....	22,558	9,909 80	3.374	2.362
Lebanon Springs.....	73,968	22,190 60	3.000	3.161
Maine Central.....	2,317,689	2,075,498 01	2.827	1.715
Montpelier and Wells River.....	203,541	53,007 20	2.264	1.975
New London Northern (leased to Central Ver- mont Railroad Company).....	No report	.....	.....	.....
Newport and Richford (operated by Canadian Pacific Railway Company).....	93,216	28,087 80	1.641	2.063
Rensselaer and Saratoga (leased to Delaware and Hudson Canal Company).....	2,443,702	888,968 02	2.331	1.672
St. Johnsbury and Lake Champlain (operated by Boston and Maine Railroad).....	162,700	74,090 14	2.369	3.632
Vermont Valley (leased to Boston and Maine Railroad).....	127,425	88,473 74	3.229	2.327
Woodstock.....	20,580	12,453 46	3.700	2.595
Total.....	15,961,873	\$7,237,696 27	41.658	26.444
Average for all roads.....	.....	.....	2.777	2.204

FREIGHT REVENUE AND RATES.

In like manner, the number of tons of freight transported by all the railroads within or operating partly within and partly outside the State, for the years 1892 and 1893, is found from the returns to be as follows:

The number of tons of freight carried in 1892 is 15,341,947, and for 1893 is 16,756,987.

The total freight revenue for the same is for 1892, \$12,078,472.57 and for 1893, \$13,293,501.21.

The average receipts per ton per mile of haul, is for the year 1892, 3.046 cents, and for 1893 is 3.2457 cents, while the average estimated cost for carrying the same per ton per mile for 1892 is 2.742 cents, and for 1893 is 2.4904 cents.

The following table shows the total tons of freight hauled by the roads respectively making returns, the revenue, the average receipts per ton per mile, and the estimated cost of the service for the last two years reported.

RAILROADS.

Estimated Cost
of Carrying
Freight per Ton
per Mile.Average
Receipts
per Ton
per Mile.Total Freight
Revenue.Number of
Tons Freight
Carried.

Atlantic and St. Lawrence, (leased to Grand Trunk Railway Company).....	891,350	.....	Cents,	.....
Barre	72,290	\$31,321 08	.....	6.820
Bennington and Rutland.....	186,918	126,815 64	.....	10.832
Central Vermont.....	2,892,580	2,127,988 16	.....	1.752
Clarendon and Pittsford.....	97,332	42,815 88	.....	0.760
Connecticut and Passumpsic Rivers, (leased to Boston and Maine Railroad).....	913,678	598,514 47	.....	0.978
Fitchburg.....	4,570,377	4,591,008 22	.....	0.819
Hosac Tunnel and Wilmington.....	17,2654	20,945 05	.....	0.925
Lebanon Springs.	40,697	35,300 56	.....	10.548
Maine Central.....	1,880,111	2,426,378 16	.....	2.819
Montpelier and Wells River.....	77,262	74,563 15	.....	1.500
Newport and Richford, (operated by Canadian Pacific Railway Company).....	464,329	60,496 76	.....	3.113
Rensselaer and Saratoga, (leased to Delaware and Hudson Canal Company).....	2,342,978	1,528,771 56	.....	0.640
St. Johnsbury and Lake Champlain, (operated by Boston and Maine Railroad).....	444,581	301,675 94	.....	1.894
Vermont Valley, (leased to Boston and Maine Railroad).....	438,971	98,035 95	.....	1.080
Woodstock.....	12,128	14,341 98	.....	0.951
Total.....	15,341,947	\$12,078,472 57	.....	9.807
Average for all roads. ....	.....	.....	.....	85.642
			.....	2.742

1893.

RAILROADS.

	Number of Tons Freight Carried.	Total Freight Revenue.	Average Receipts per Ton per Mile.	Estimated Cost of Carrying Freight per Ton per Mile.
Atlantic and St. Lawrence, (leased to Grand Trunk Railway Company).....	1,036,677	\$863,371 41	Cents. 0.788	Not given.
Barre.....	60,782	27,978 16	11.507	" "
Bennington and Rutland.....	802,858	155,245 05	1.156	" "
Bristol.....	No report.	.....	.....	.....
Central Vermont.....	2,970,476	1,949,385 99	0.796	0.559
Clarendon and Pittsford.....	94,627	38,720 89	8.796	Not given.
Connecticut and Passumpsic Rivers, (leased to Boston and Maine Railroad).....	921,343	627,337 12	0.8338	0.636
Fair Ground.....	No	account	kept.	.....
Fitchburg.....	4,873,330	4,847,615 68	0.923	0.707
Hoosac Tunnel and Wilmington.....	24,303 11	25,811 50	7.503	5.748
Lebanon Springs.....	40,070	37,121 41	2.631	3.434
Maine Central.....	2,238,851	2,720,453 80	1.549	0.961
Montpelier and Wells River.....	107,687	79,741 73	2.285	1.790
New London Northern, (leased to Central Vermont Railroad Company).....	Not	reported.	.....	.....
Newport and Richford, (operated by Canadian Pacific Railway Company).....	476,256	66,376 20	0.721	0.603
Reusselaer and Saratoga, (leased to Delaware and Hud- son Canal Company).....	2,071,225	1,448,300 96	1.204	0.778
St. Johnsbury and Lake Champlain, (operated by Bos- ton and Maine Railroad).....	486,327	277,821 78	0.950	1.004
Vermont Valley, (leased to Boston and Maine Railroad).....	438,446	103,274 60	0.986	0.609
Woodstock.....	14,746	15,912 93	9.274	7.955
Total.....	16,756,987	\$13,238,501 21	51.9318	24.904
Average for all roads.....			8.2457	2.075

GROSS EARNINGS, OPERATING EXPENSES, NET INCOME, DEFICIT,
DIVIDENDS, ETC.

The following table presents a variety of data which the Board deems "appropriate and important for the information of the Legislature."

The same is collated from the sworn returns of the several railroad companies for the year 1893.

1893.

RAILROADS.

	Gross Earnings From Operation.	Operating Expenses.	Income from Operation.	Income from other Sources.	Deductions from Income, Interest, Taxes, Rentals, etc.	Net Income.	Deficit.	Dividends on Stock, 1892.
Atlantic and St. Lawrence, leased to Grand Trunk Railway Company).....	\$1,231,704 46	\$934,598 10	\$297,106 06	.....	\$575,829 54	.....	\$278,723 48	6 per cent.
Barre.	32,080 25	30,018 64	12,061 42	.....	9,654 88	\$2,406 54	.....	None.
Bennington and Rutland.....	284,731 69	210,741 10	73,990 39	.....	40,478 30	33,512 09	.....	"
Bristol.....	15,110 90	8,444 08	6,666 31	.....	6,000 00	666 31	.....	"
Central Vermont.....	3,131,918 71	2,181,418 24	950,730 47	\$14,200 00	195,914 80	18,075 67	.....	"
Clarendon and Pittsford.....	42,329 80	28,290 91	14,038 08	.....	13,525 95	512 03	.....	"
Connecticut and Passumpsic Rivers, leased to Boston and Maine Railroad).....	1,037,021 83	737,987 29	299,034 24	13,568 71	21,835 00	277 95	.....	5 per cent.
Fair Ground.....	1,003 15	724 56	878 29	.....	.....	878 29	.....	5 p. c., '93
Fitchburg.....	7,707,297 60	5,542,089 01	2,165,628 08	.....	1,404,882 31	699,786 37	.....	4 p. c. on prof.
Hosac Tunnel and Wilmington.....	37,478 41	26,097 55	10,780 86	1,197 73	11,774 36	204 23	.....	None.
Lebanon Springs.....	64,632 15	71,073 01	6,921 45	1,878 23	358 79	5,562 62	.....	6 per cent.
Maine Central.....	5,059,254 62	3,223,429 12	1,835,805 47	95,180 34	1,401,397 61	470,598 30	.....	None.
Montpelier and Wells River.....	136,691 65	107,015 33	32,676 33	.....	18,019 04	14,657 29	.....	7 and 8 per c.
New London Northern, leased to Central Vermont Railroad Company).....	.....	.....	.....	.....	.....	.....	.....	None.
Newport and Richford, (operated by Canadian Pacific Railway Company).....	99,630 92	89,319 12	19,311 80	.....	89,840 32	.....	79,528 42	8 per cent.
Rensselaer and Saratoga, leased to Delaware and Hudson Canal Company).....	2,501,381 09	1,572,923 80	928,457 29	9,545 00	1,123,128 91	.....	185,126 62	None.
St. Johnsbury and Lake Champlain, (operated by Boston and Maine Railroad).....	397,337 94	407,074 46	39,736 52	*7,397 37	46,531 94	.....	93,525 83	6 per cent.
Vermont Valley, leased to Boston and Maine Railroad.....	201,052 73	135,922 57	64,730 21	44,702 01	49,243 67	60,348 55	.....	1 per cent.
Woodstock.....	29,802 47	22,386 02	7,416 45	.....	774 94	6,641 51	.....

*Deficit.

WAGES OF EMPLOYES.

The tables next following show the daily compensation paid by the railroad companies to their employes, so far as said companies have complied with the forms in that respect and furnished the same to the Board, with a statement of the average daily wages paid each class at the bottom of the tables.

These tables cover the returns for 1892 and 1893, many of the returns of 1894 not being received seasonably for abstracting the data for comparison with last year.

In this service, stated trips or round trips are designated for a day's work on some roads, and a stated number of hours makes a day on others, and for work in excess of either, extra pay is allowed.

TABLE OF WAGES PAID IN 1892-1893.

For the year ending June 30th, 1893.		RAILROAD COMPANIES.														
Atlantic and St. Lawrence (leased to G. T. Ry. Co.)..	General Office Clerks.	Station Agent.	Other Men.	Engineers.	Firemen.	Conductors.	Other Trainmen.	Machinists.	Carpenters and Bridgemen.	Other Shopmen.	Section Foremen.	Other Trackmen.	Switchmen and Watchmen.	Telegraph Operators.	Employees and Laborers.	
Barre.....	All wages paid by the company.....	2.61	2.01	1.31	1.70	1.15	1.56	1.60	1.95	1.24	1.95	1.24	1.95	1.24	1.95	1.24
Bennington and Rutland	Not given.....	1.28	1.23	2.96	1.55	2.76	1.53	1.75	1.85	1.43	1.57	1.21	1.15	1.92	1.25	
Bristol.....	Not given.....	1.73	1.34	2.41	1.33	2.09	1.44	1.64	1.32	1.27	.98	.98	1.31	2.31	.78	
Central Vermont.....	Not given.....	1.05	2.55	1.58	1.51	1.31	1.31	.....	1.41	.....	1.53	.99	.....	.....	.....
Clarendon and Pittsford.....	Not given.....	1.43	1.40	2.70	1.59	2.12	1.60	2.19	1.76	1.51	1.62	1.20	1.22	1.63	1.54	
Connecticut and Passumpsic Rivers, (leased to B. and M.)	Not reported.....	1.96	1.85	1.84	3.50	1.92	1.93	2.36	2.10	2.00	2.34	1.50	1.41	1.75	1.74	
Fitchburg.....	Not reported.....	1.65	1.59	1.41	2.67	1.31	1.73	1.67	1.92	1.54	1.56	1.36	1.19	.....	.....
Hosack Tunnel and Wilmett.....	Not reported.....	1.72	1.19	.....	2.79	1.72	1.41	2.08	2.15	1.31	1.55	1.10	.91	.54	.....
Lebanon Springs.....	Not reported.....	2.43	1.99	1.70	3.11	1.95	2.69	1.77	2.04	1.84	1.72	1.31	1.40	1.66	1.48	
Maine Central.....	Not reported.....	1.73	1.40	1.24	2.23	1.66	2.49	1.57	2.56	1.93	2.03	1.50	1.17	1.09	.....
Montpelier and Wells River. Newport & Richford (oper- ated by C. P. Ry. Co.)....	Not reported.....	1.74	2.11	1.59	3.90	2.19	1.52	2.02	2.02	1.55	1.63	1.14	1.48	2.09	1.41	
Rensselaer & Saratoga (leased to D. & H. C. Co.).....	Not reported.....	1.34	1.28	1.00	2.70	1.53	2.07	1.51	1.93	1.85	1.21	1.20	1.18	1.59	.....
St. Johnsbury & Lake Cham- plain (operated by B. & M.)	Not given.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vermont Valley, (leased to B. & M. R. R.).....	Not given.....	1.38	2.60	1.65	2.04	1.50	1.50	.....	.....	.....	.....	1.25	.....	.....	.....
Woodstock.....	Not given.....	1.43	1.38	2.73	1.64	2.27	1.53	2.07	1.83	1.56	1.57	1.20	1.21	1.69	1.37	
Average compensation on all roads.....	Not given.....	1.94	1.43	1.38	2.73	1.64	2.27	1.53	2.07	1.83	1.56	1.20	1.21	1.69	1.37	

PHYSICAL CONDITION OF RAILROADS.

The elementary conditions under which the different railroads of this State were constructed vary so little that these conditions have given little advantage in the cost of building, maintenance and operation of one road over another.

The State extends but little more than two degrees north and south, and the difference in climate,—an important factor in some of the larger States,—is of comparatively little consequence as between the different railroads in Vermont. Thus, if deeper snow is encountered on the east side, deeper frost is found on the west side of the mountains which divide the State into two nearly equal parts; and, as all of our railroads of any considerable length, with one exception, run in a northerly and southerly direction, all, with the one exception, are subject to the disadvantage of these two elements in a nearly equal degree.

The soil and topography of the country along the line of any one railroad afford but little appreciable advantage over that of any other. If one has longer bridges to build and maintain, another has them the more numerous, and as all follow the valleys and the lowest attainable lands, and as all of these valleys and lowlands are intersected by many streams and ravines, the bridges on all of the trunk lines are frequent and some of them are of very considerable length.

Nearly the same equable conditions exist when soil and surface are taken into account. On some of the lines deep, long and expensive rock cutting and earth excavations were found necessary, but these disadvantages found compensation in long stretches of comparatively smooth and level surface where the cost of construction could be reduced to a minimum.

During the period of construction, timber for bridges, depots and ties was abundant and inexpensive, and, if this indispensable material has now become scarce in some portions of the State, an abundant supply can be found in Canada at a low price, whence it can be transported at a reasonable rate; and ballast, that all important material for the per-

fect condition of the roadbed, was and is now found in sufficient quantities and within reasonable distances along all of the lines within the State so that, if the different railroads were not constructed and are not maintained up to a uniform standard of excellence, it is not attributable in any large measure to the physical conditions under which they have labored.

There has been manifested in the management of all the railroads of the State a progressive spirit, and, if one has accomplished more in the way of permanent improvements, it is reasonable to suppose that the improvements were made in consequence of greater financial resources on the part of those which have made these betterments, rather than because of any unwillingness on the part of those which have done less in this respect.

The introduction of heavier rolling stock on nearly all of the trunk lines has compelled the re-inforcement or re-construction of many of the older bridges, and the activity, with its attendant expense, shown in this department, has precluded corresponding improvements in roadway and track during the same time. But, while the improvements have not been so marked and noticeable in the track department as in that of buildings and bridges, yet on some of the roads good progress has been made, and on none has the roadbed or track, not even on the subsidiary lines, been permitted to deteriorate. Some superstructures were built in a solid and substantial manner such that few changes have been made, and, although there have been frequent changes to what are called higher standards of roadbed construction and maintenance, yet, it is still an open question whether such enduring embankments as are found on the Rutland & Burlington Railroad, and built 45 years ago, are not the equal of any of later design and more modern construction.

Still, it can hardly be said that the State has much, if any, ideal roadbed and track within its limits; but, if this is conceded, it is safe to affirm that, even if none of the railroads are up to the highest standard of excellence in respect to

roadbed and track, yet several of them nearly approach thereto, and, from personal observations, the Board is able to make the statement that, as a general proposition, in these particular factors of railroad construction, our railroads are fully equal to those in some of the adjoining States; and if all of the main lines were ballasted equally as deep as the Atlantic and St. Lawrence Railroad, operated under the Grand Trunk Railway system, they would doubtless compare favorably with the railroads of any State in this country.

Speaking in a general way, however, improvements, although very considerable, have not been so marked during the biennial period ending June 30th, 1894, as during the two preceding years. Considerable ballast has been drawn on and spread along the lines, old, light and worn rails have been taken up and new and heavier rails substituted, and it is worthy of note that the renewals of ties have been so well made that but few decayed ones were observed on the entire mileage of main line track in the State, this year.

With the exception of two, the narrow gauge railroads, the subsidiary roads or "feeders" remain in substantially the same physical condition as when inspected in 1892. The Bristol Railroad was completed and opened for traffic in January, 1892. Its roadbed was well and thoroughly built, with ditches of sufficient depth to obtain good drainage, and the culverts were well placed and of ample capacity. The track was laid in good alignment and, altogether, for a second class road doing only a local business, it is open to but little, if any criticism. The other standard gauge "feeders," like the Addison, and Missisquoi Valley, are largely surface roads. The roadbeds are low and narrow and destitute of ballast and the rails, taken mostly from other roads where they had seen service, are old and considerably worn, but as the ties are generally sound upon which these rails rest, the rolling stock is light and the speed of trains is moderate, no accident of moment has happened upon these railroads during the last two years that can be attributed to the faulty condition of the roadbed or track.

The Hoosac Tunnel and Wilmington Railroad was evidently constructed in haste. In many places the roadbed was insufficient, the ditches were shallow and the grades were irregular. All of these defects have been largely removed and, with a moderate additional expenditure, this railroad will be adequate for public safety and convenience.

DEPOTS.

It is unnecessary to appeal to the memory of the "oldest inhabitant" to ascertain the form, finish, or material of the earliest railroad depots, for persons are now living who can well remember back to 1827, when the first railroad, the Baltimore and Ohio, was chartered in this country, and many when, in 1842, the Fitchburg; and in 1843, the Connecticut and Passumpsic Rivers, and the old Vermont Central received their charters from the State of Vermont.

Besides, many of the old depots of the ancient design and construction are still standing and doing service, and the observant traveler of today can readily contrast the dissimilarity and easily determine the great superiority of the modern over the ancient depots, in all that pertains to the comfort, pleasure or convenience of their patrons. These old depots are now stigmatized by some as "decaying relics" of former days, but, like the block houses of our grandfathers, they supplied the wants of their day and generation, and comported well with the financial ability of the railroad companies and the less exacting and urgent demands of the traveling public of that day.

In this State, when these old structures have been allowed to remain, they have been generally repaired and rendered comfortable, if not altogether convenient. A few, however, are lacking in both of these conditions, special mention of which will be found under the head of "Sketches and Inspections" in this report. A few, also, were faultily located, the approaches thereto being somewhat dangerous and unsuitable; but in all cases when the attention of the railroad companies interested has been called, either to the insuffi-

ciency, or the faulty location of their depots, they have manifested a willingness to make the needed changes as soon as time and their financial ability would permit such improvements to be made.

Other and more pressing requirements have made the progress in new construction of depots slow, but, if slow, it has been steady, the Board noting, with much satisfaction at each succeeding inspection, new depots completed or in process of building, and in all instances these new structures have been modeled after the standard designs now obtaining, have been conveniently located, and have high, airy waiting rooms, water flushed closets, steam or hot water heat, broad awnings, long, and in some cases covered platforms, and all of adequate size to accommodate the present, or prospective business of their respective localities.

During the inspections made in the preceding biennial term, some of the waiting rooms were found uncleanly, and the sanitary state of the closets bad, but, at the last inspection, it was observed with pleasure that this unnecessary state of things had been largely changed for the better.

RAILROAD BRIDGES.

The most important branch of the duties of the Board bearing upon the physical condition of the railroads of the State, is believed to be that which relates to the condition of its bridge systems and structures.

In matters of clear height and width the law points out the conditions of structural safety, for all bridges of recent or future construction, and directs also the safety appliances to be provided for the protection of trainmen at the approaches of those of ancient build and low coverings.

Upon the passage of the law for the prevention of accidents to trainmen, and the early recommendations of the Board pursuant thereto in January, 1893, requiring the tell-tale warnings to be placed at the approaches of bridges, the Board found that many of the companies had complied with the statute and recommendations before the statute took effect.

with the result that no life has been lost and no injury has been sustained since the law and recommendations thereunder came into force, April 1, 1893, with a single exception, that soon after the passage of the law, a trainman was slightly injured while standing upon an exceptionally high car, by coming in contact with an overhead bridge.

This statute, like that for blocking frogs, switches, etc., has proved of great good in the interest of safety to the lives of brakemen, and the promptness with which its provisions have been complied with by the railroad companies is commendable.

As would be looked for, the condition of the railway bridges of the State has been constantly and steadily improving from year to year, and upon several of the more important lines the amount of new work in renewing and strengthening the bridges and in replacing those of the older class with new and modern iron structures, an unusual progress has been made in the last biennial term.

Upon the Central Vermont system, ten new riveted lattice or iron girder bridges have been built, and the Georgia bridge over the Lamoille river, 600 feet in length, is being replaced by a riveted lattice which is nearly completed.

Upon the Rutland Division of this system alone, nineteen new bridges have been laid by Engineer Roys, all of which are of the modern and standard iron type, and one of them, the Middlebury bridge, is believed to be the strongest bridge structure of the large class in the State. The cost of these new iron bridges on this division in the last two years is \$112,681.23, and two long, heavy truss, wooden bridges have also been built by Engineer Roys, costing about \$12,000.00.

In all instances of renewal of the floor systems or of rebuilding the bridges, the standard system has been adopted; close and long ties, safety-guards gained to the ties and securely bolted to the bridge timbers, and in not a few instances the inside guard rail is also provided, thus insuring to a high degree of probability the passage of a derailed car or number of cars over or through these bridges in safety.

No accident has occurred in the two years past, by reason of the imperfect or inadequate quality of a railroad bridge superstructure on any of the roads of this State.

Five bridges, however, of recent construction, on the Passumpsic Division of the Boston and Maine Railroad, were found to be of less width from side to side than the law permits.

This fact was developed through the fatal accident to O. M. Wilmot, reported among the investigations in Part III of this report. The company proceeded at once to rebuild all these bridges of the standard width of clearance, and notified the Board of their completion and compliance with the law.

Also, a sad accident occurred by the falling of an iron, link and pin bridge over Nulhegan creek in Bloomfield, on the Grand Trunk Railway, in April last. The investigation is still pending, being delayed until the foundation stone shall be displaced for relaying, in order that the Board may be able to ascertain definitely the cause of the accident.

Nothing has yet appeared in investigation had, indicating that the accident is attributable to the inadequacy, or structural weakness of the bridge structure proper, although the same has been reported by the Board as below the standard factor of safety.

The long and dangerous trestle work on the Montpelier and White River Railroad, between Montpelier and Williamstown, which the Board has criticised adversely in former reports, has nearly all disappeared by being filled with earth, and converted into standard roadbed, and the work is now near completion.

The masonry of the newly constructed iron bridges has generally been relaid, but in some instances the old piers and abutments of our railroads are still deemed standard by the bridge-masters and are retained.

As a whole, the Board is pleased to report that the railroad companies are generally progressive in the introduction of a good standard of bridge construction in the State, and are expending large sums in this important branch of permanent improvement.

From the fact that a railroad bridge was safe a few years ago, it does not follow that it is safe to-day. It may be that the increase in the rolling stock of railroads is still to continue, but it is claimed by some of our engineers, that it has reached its limit. Any further strides of increase, like those of the past eight years, would call for a like increase in the size and strength of bridges, rails, etc., and it would seem to be wasteful economy to go further in this direction.

All of our latest built iron bridges have been wisely placed with a margin of safety for a possible increase in the weight of rolling stock in the near future.

BLOCKING OF FROGS, SWITCHES, ETC.

By an act approved November 28, 1888, every railroad company operating in the State was required to adjust, fill or block, with a wooden block or wedge, the frogs, switches and guard-rails on its tracks, so as to prevent the feet of its employes from being caught therein, the same being done on or before December 1, A. D. 1889, to the satisfaction of the Railroad Commissioners.

No penalty was attached to the disregard of this law.

The railroads complied promptly in most instances with its requirements, and were duly certified after inspection and approval.

The manner of keeping this blocking up and effective of the object of the law has been a matter of investigation in the several inspections and on all occasions when noticeable.

Although there seems to be no requirement of law that this blocking shall be maintained after December 1, 1889 (an evident oversight in the draft of the bill) the Board has noticed that this safety provision has, in general, been kept up, with the result that in the last four years no accident has come to the knowledge of the Board by this once frequent cause of loss of life or limb of trainmen. The omission in the statute should be cured by an amendment requiring this blocking to be kept good.

SAFETY APPLIANCES.

In the last two biennial reports the Board referred to this subject and it was discussed at length in Vol. II, pages 27 to 32 inclusive. The results of Congressional legislation then anticipated have been realized. The Washington conference of the Interstate and State Commissions has recommended to Congress the enactment of a law to promote the safety of the lives of trainmen and travelers, and upon these recommendations, Congress passed the following Act in March, A. D. 1893, viz.:

"An Act to Promote the Safety of Employes and Travelers upon Railroads by Compelling Common Carriers Engaged in Interstate Commerce to Equip their Cars with Automatic Couplers and Continuous Brakes, and their Locomotives with Driving Wheel Brakes, and for other Purposes.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled,

That from and after the first day of January, eighteen hundred and ninety-eight, it shall be unlawful for any common carrier engaged in interstate commerce by railroad to use on its line any locomotive engine in moving interstate traffic not equipped with a power driving-wheel brake and appliances for operating the train brake system, or to run any train in such traffic after said date that has not a sufficient number of cars in it so equipped with power or train brakes that the engineer on the locomotive drawing such train can control its speed without requiring brakemen to use the common hand brake for that purpose.

SECT. 2. That on and after the first day of January, eighteen hundred and ninety-eight, it shall be unlawful for any such common carrier to haul or permit to be hauled or used on its line any car used in moving interstate traffic not equipped with couplers coupling automatically by impact, and which can be uncoupled without the necessity of men going between the ends of the cars.

SECT. 3. That when any person, firm, company or corporation engaged in interstate commerce by railroad shall have

equipped a sufficient number of its cars so as to comply with the provisions of section one of this act, it may lawfully refuse to receive from connecting lines of road or shippers any cars not equipped sufficiently, in accordance with the first section of this act, with such power or train brakes as will work and readily interchange with the brakes in use on its own cars, as required by this act.

SECT. 4. That from and after the first day of July, eighteen hundred and ninety-five, until otherwise ordered by the Interstate Commerce Commission, it shall be unlawful for any railroad company to use any car in interstate commerce that is not provided with secure grab-irons or hand-holds in the ends and sides of each car for greater security to men in coupling and uncoupling cars.

SECT. 5. That within ninety days from the passage of this act, the American Railway Association is authorized hereby to designate to the Interstate Commerce Commission the standard height of drawbars for freight cars, measured perpendicular from the level of the tops of the rails to the centers of the drawbars, for each of the several gauges of railroads in use in the United States, and shall fix a maximum variation from such standard height to be allowed between the drawbars of empty and loaded cars. Upon their determination being certified to the Interstate Commerce Commission, said commission shall at once give notice of the standard fixed upon to all common carriers, owners or lessees engaged in interstate commerce in the United States by such means as the commission may deem proper. But should said association fail to determine a standard as above provided, it shall be the duty of the Interstate Commerce Commission to do so before July first, eighteen hundred and ninety-four, and immediately give notice thereof as aforesaid. And after July first, eighteen hundred and ninety-five, no cars, either loaded or unloaded, shall be used in interstate traffic which do not comply with the standard above provided for.

SECT. 6. That any such common carrier using any locomotive engine, running any train, or hauling or permitting to be hauled or used on its line any car, in violation of any of the pro-

visions of this act, shall be liable to a penalty of one hundred dollars for each and every such violation, to be recovered in a suit or suits to be brought by the United States district attorney in the district court of the United States having jurisdiction in the locality where such violation shall have been committed; and it shall be the duty of such district attorney to bring such suits upon duly verified information being lodged with him of such violation having occurred. And it shall also be the duty of the Interstate Commerce Commission to lodge with the proper district attorneys information of any such violations as may come to its knowledge: *provided*, That nothing in this act contained shall apply to trains composed of four wheel cars or to locomotives used in hauling such trains.

SECT. 7. That the Interstate Commerce Commission may from time to time upon full hearing and for good cause extend the period within which any common carrier shall comply with the provisions of this act.

SECT. 8. That any employe of any such common carrier who may be injured by any locomotive, car, or train in use contrary to the provisions of this act, shall not be deemed thereby to have assumed the risk thereby occasioned, although continuing in the employment of such carrier after the unlawful use of such locomotive, car, or train had been brought to his knowledge. (Approved March 2, 1893.)"

With power brakes to locomotive driving wheels, with the train-brake system under control of the engineer, with all equipment connected with the locomotive throughout the train, with automatic impact car couplers, with the securities provided for safety in coupling and uncoupling, and all facilitated and rendered safer by the standard and uniform height of drawbars of freight cars, as provided in this statute for interstate traffic, the problem of how to reduce the appalling danger to the lives and limbs of trainmen as victims of the link and pin coupler, and of the shock and jerk of trains, will soon be solved.

The standard of height of freight car drawbars was duly fixed and notified by the Commission at 34½ inches for stand-

ard gauge roads and about 26 inches for narrow gauge roads with a maximum variation of three inches between the draw-bars of empty and loaded cars.

No particular type of automatic coupler has been designated. The duty of every railroad company will be to get the best and have them in use on all its interstate traffic cars in the time fixed by law.

The comparatively few cars in use in strictly local traffic will soon after be supplied with the same safety appliances, failing in which they can be encouraged to it by future legislation.

As the law requiring these corporantion returns has been for the six years prior to the session of 1892, the Board has been unable to obtain them in season for its possible compliance with the statute requiring the biennial report to be made to the General Assembly at a seasonable period of its session.

The reasons for the delay on the part of some of the railroad companies were obvious and were claimed to be unavoidable.

The fact of the failure of the companies to make seasonable compliance with the law in respect to the time in which their annual returns were to be made to the Board has been brought to the attention of the Legislature in previous reports, and the delinquent companies have been enjoined repeatedly and often, of the necessity of an earlier compliance with the statutory requirements, in the years of the biennial sessions of the General Assembly. The difficulties to be met, by some of the corporations having business connections with other companies, on the reports of which their returns to the Board were in part to be made up, rendered it next to impossible to make up their answers to the great number of questions required by the established form of returns.

The delay has caused repeated embarrassment to the Board, and annoyance to the Legislature. It has heretofore seemed unavoidable.

The Board has sought to obviate the delay by presenting this report in seasonable compliance with the law by the only

method deemed possible. This report covers the biennial period, to the time of its going to press, in all that represents the record of its proceedings under the law, including its inspections, hearings, decisions, inquiries and investigations, etc., the same as heretofore, while its statistical reports, and deductions therefrom, including the railroad returns and tabulated statements based upon the same, cover the years 1892 and 1893 and do not include the current railroad year, the returns of which are not yet fully before the Board.

Experience in the unavoidable hindrances that have confronted the Board in getting its report in press in season for its presentation to the Legislature, at the opening of its session, and the advance sheets of it into the hands of the retiring and incoming Governors, in time for their due consideration of the same in their respective messages, has called for the set back of one year in such statistical data in this report as are deduced and based upon the corporation returns. In other respects the representations of the report cover the record of all proceedings and work of the Board as heretofore, and the long standing embarrassment and annoyance caused by the delay of the returns and the report, both to the Board and the two departments of the General Assembly, may hereafter be avoided, provided that the printer fulfills his contract for the getting out of the report in time.

MILEAGE TICKETS.

In the last report of the Board, this subject was discussed upon pages 48 to 50, wherein special reference was made to the statutes of other States enacted for the object of making this class of tickets and mileage books interchangeable between different railroads.

The Board did not recommend legislation in this direction, but chose rather to await the outcome of litigation then pending in the State of Massachusetts for the purpose of testing the constitutionality of an act then recently enacted in that State, providing for the issuance and interchangeableness of this class of tickets by all the railroads of that State.

The act is as follows :

[CHAPTER 389]

SECTION 1. Every railroad corporation operating within this Commonwealth shall provide and have on sale, for twenty dollars, mileage tickets representing one thousand miles, which shall be accepted and received for fare and passage upon all railroad lines in this Commonwealth, as well and under like conditions as upon the line or lines of the corporation issuing such ticket.

SECT. 2. Such tickets or any part thereof shall be redeemed by each corporation issuing the same, upon presentation by any other railroad corporation.

SECT. 3. On petition of any railroad corporation included within the provisions of this act, filed with the railroad commissioners, asking that it may be exempt, or that any other railroad be excluded from the provisions of this act, said commissioners may in their discretion exempt or exclude such railroad from the provisions of this act, if in their judgment the public welfare or the financial condition of the road require or demand it.

SECT. 4. This act shall take effect on the first day of October in the year eighteen hundred and ninety-two.

This Board deemed it advisable to await the result of this contention, and indeed questioned both its legality and policy, but expressed the hope that an arrangement might be arrived at whereby such a convenient method might be ultimately attained.

The result of the litigation was against the constitutionality of the statute above quoted, and it was adjudged void, though by a divided bench, five concurring in the decision and two dissenting.

The opinion was delivered by Chief Justice Field, and a full consideration and discussion of this very important case, which has excited attention in several other States with a view to similar legislation, and which is too voluminous to be extended here, may be found in the last Railroad Commissioners' Report of Massachusetts, on pages 26 to 41, to be found in both the State and the Railroad Commissioners' libraries in the capitol, and the full text of the case with the reason-

ing and opinion of the court as well as that of the dissenting judges, is also in the Massachusetts Court Reports in our State library.

RAILROAD MAP.

The railroad map may be found as the frontispiece of the Report and the same has been revised and shows the railroad mileage of the State at the present time.

HEATING AND LIGHTING PASSENGER CARS.

These subjects have been fully considered under the respective titles in all the former reports of the Board. The principle of locomotive steam heating, under low pressure and under the control of the conductor and trainmen, has come into complete use upon all unmixed passenger trains, and its superiority over all other methods is known and recognized by the public. Its inconvenience and discomfort to the travelers are noticeable only where the neglect or incompetency of those in charge of trains make them so.

As to lighting, the Pintsch system of gas lighting has obtained on many of the first class railroads of the country, and appears to be most approved for safety and abundant light, while coal oil at the safety test of 300° Fahrenheit is still in general use throughout the state.

CONSOLIDATIONS.

The Board has no new views to submit under this head but begs to refer to its reports thereon in Vol. 2, pages 37 to 43 inclusive, and in Vol. 3, page 48, as embodying the views to which it still adheres.

TELL-TALE WARNING.

The following circular was issued to the several railroad companies of the State, May 8, 1893:

To the Railroad Companies of the State of Vermont:

Act No. 65, Session Laws of 1892, entitled "An Act for the Prevention of Accidents to Trainmen," provides as follows, viz.:

SECTION 1. Every railroad company operating a railroad, or part of a railroad, in this State, shall place at the approaches of all its bridges and the highway bridges or other structures which cover or extend over its track, and does not leave a clear height of twenty feet from the top of the rails to the lowest parts of said bridges or other structures directly over said rails, such tell-tale warnings, or other safety devices of uniform pattern, for warning trainmen of their approach thereto, as shall be recommended by the Board of Railroad Commissioners.

SECTION 2. This act shall take effect April 1, 1893.

Pursuant to said act the Board of Railroad Commissioners, at its stated monthly session at Montpelier, on the 4th instant, concluded its consideration of the various devices suggested by the railroad companies; and the "Standard Bridge Tickler," so called, adopted and in general use upon the railroad line of the Delaware & Hudson Canal Company, or the device called the "Tell-tale Warning," now in use on the Ogdensburg Division of the Central Vermont Railroad, and heretofore (and before the passage of said act) recommended by the Board for adoption on the railroads of the State requiring safety appliances for such protection, are now recommended to the railroad companies for use under the provisions of said act.

These devices are of uniform pattern, varying only in immaterial details of mechanism, and all companies which have already complied substantially or reasonably with said former recommendation of the Board, or which shall hereafter, in compliance with the statute, place warning devices in substantial conformity to either of these patterns, will be deemed as having complied with said statute.

sought and obtained as indicated in the subjoined correspondence:

INTERSTATE COMMERCE COMMISSION, }
WASHINGTON, November 1, 1892. }

Vermont Railroad Commission, Montpelier, Vermont.

GENTLEMEN:—Will you kindly address a communication to the Interstate Commerce Commission giving your opinion as to whether it is practicable, and if so, advisable, to amend the Fifth Section of the Act to regulate commerce so as to legalize such contracts between competing roads as would tend to diminish unlawful discrimination and preferences in rates, and to maintain lawfully authorized reasonable rates; and stating the form of amendment that you think will best accomplish such result. Your paper will be confidential as to its source, if you desire; but we prefer to be at liberty to give it the authority of your name.

A reply as early as practicable is desired.

Very respectfully,

(Signed,)

W. G. VEAZEY,
Acting Chairman.

STATE OF VERMONT. }
BOARD OF RAILROAD COMMISSIONERS. }
HARTFORD, January 9th, 1893. }

To the Hon. Interstate Commerce Commission, Washington, D. C.

GENTLEMEN:—In your late communication through Acting Chairman W. G. Veazey, you ask the opinion of this Board, as to whether it is practicable, and, if so, advisable, to amend the 5th Section of the Act to regulate commerce so as to legalize such contracts between competing roads as would tend to diminish unlawful discriminations and preferences in rates, and to maintain lawfully authorized reasonable rates; and as

to the form of amendment which would seem best to insure such results. In reply thereto the Board directs me to say that upon such study and consideration of the subject as we have been able to give, it is the unanimous opinion of the Board, that an amendment of the character outlined would be both practicable and advisable.

In the delicate service of a practical formulation of an amendment to said section for the accomplishment of the important ends, the Board would choose to defer to the more practical experience and familiarity of those who have the matter in hand, without an attempt at definite outline from us.

Very respectfully,

SAM'L E. PINGREE,

Chairman.

RECOMMENDATIONS FOR LEGISLATION.

The Board makes the following recommendations for additions and changes in the railroad laws:

DANGEROUS CROSSINGS.

That railroad companies be authorized by appropriate legislation to take lands adjoining their roads near highway grade crossings for the purpose of removing obstacles dangerous to travel and obstructions to view of approaching trains by the highway travelers approaching the same;

HARMONY IN LEGISLATION.

In accordance with an invitation issued by the Massachusetts Board of Railroad Commissioners to the other New England States, a conference was held at the rooms of

Massachusetts Board on Friday, December 11th, 1891, at 10 A. M. The following Commissioners were present:

D. N. Mortland of Maine, A. W. Wildes of Maine, Roscoe Bowers of Maine, H. M. Putney of New Hampshire, Ex-Governor B. F. Prescott of New Hampshire, Ex-Governor Samuel E. Pingree of Vermont, E. L. Freeman of Rhode Island, George M. Woodruff of Connecticut, William H. Hayward of Connecticut, William O. Seymour of Connecticut, George G. Crocker of Massachusetts, Everett A. Stevens of Massachusetts.

The meeting was called to order by Mr. Crocker, and on motion of Mr. Woodruff, Ex-Governor Pingree of Vermont was made Chairman of the meeting.

Mr. Wm. J. McCullough acted as Secretary.

After discussion, the following resolution was unanimously adopted:

Resolved—That we deem it expedient that a compilation of the steam railroad laws of the New England States and of the State of New York should be prepared and printed, such laws to be so arranged as to facilitate a comparison of cognate provisions, but omitting from such compilation any laws not general in their character."

On motion of Mr. Crocker it was voted that a committee of three be appointed to take such action as they deem expedient with reference to the proposed compilation. The Chairman appointed the following named gentlemen:

George G. Crocker of Massachusetts, D. N. Mortland of Maine, George M. Woodruff of Connecticut.

Attest,

WM. J. McCULLOUGH,

Secretary.

The railroads of all these States, save Rhode Island, extend into and some of them through our State. The Board deem such a compilation of great importance, and recommends such legislation on the part of our State as may enable the Railroad Commissioners to concur in the publication of such compilation.

All of which is respectfully submitted.

SAMUEL E. PINGREE,	}	Railroad Commissioners.
AMORY DAVISON,		
LEON G. BAGLEY,		

Attest,

ALFRED E. WATSON,
Clerk.

September 15, 1894.

PART II.

RAILROAD SKETCHES,
GENERAL AND SPECIAL
INSPECTIONS.

SKETCHES AND GENERAL INSPECTIONS.

BARRE RAILROAD.

Line of Road.—From the southerly terminus of the Barre Branch of the Montpelier and Wells River Railroad, near the northerly limits of Barre village, through the village southerly, to the granite quarries on the high hill in the southerly part of the town. Total length of track now completed and in operation, 24 miles; 9.26 miles of which are main line and 14.74 miles are spur tracks to the quarries, side tracks, switch backs, and belt line around the top of the mountain. Gauge, standard. Rails, steel, the main line being 60 pounds and the remainder 56 pounds weight per lineal yard.

History.—This road was organized under the general laws of the State, and its articles of association were filed with the Secretary of State in the autumn of 1888. Construction was at once begun, and the main line was completed and in operation in the summer of 1889. The spur tracks and sidings have been added from time to time as the growth of the granite business has required.

Inspections.—The inspection for 1893 was made on October 5th, by Commissioners Pingree, Davison and Bagley, accompanied by F. W. Stanyan, General Superintendent; F. E. Dodge, Road-Master; and C. F. Robinson, Bridge-Master. The last inspection was made July 27th, 1894, by the same Commissioners together with the same officers of the company.

Since the last Biennial Report the East Barre and Chelsea Railroad Company, a separate corporation, has completed its road from the main line of the Barre Railroad to East Barre

village, a distance of about a mile and a half. This new road was constructed mainly by the people of East Barre, and is operated by the Barre Railroad Company under a temporary arrangement, pending the execution of a proposed perpetual lease to the latter company. The new road is laid with 56 pounds steel. There is but little fencing yet erected. Two highway grade crossings are unprovided with the crossing signs required by law.

The main line of the Barre Railroad has been maintained in fair condition during the last two years. The necessary renewals of ties have been made, and tie plates and rail braces have been placed on a large portion of the curves. The ties are being thickened up to about 3,000 to the mile. But little attention is paid to the cutting of weeds and bushes along the track. All public highway crossings are supplied with lawful crossing signs, but there are many much-used private crossings which are used to quite an extent by the general public, which have no warning signs of any description. About one mile of spurs and side tracks were laid in 1893 and about 900 feet in 1894. A commodious depot has been built at "Langdon's."

As a whole, this road is maintained and operated in a manner appropriate for the purposes for which it is used. Some 10,000 passengers, including workmen and sight-seers, are carried up the mountain annually, but the principal revenue is derived from hauling supplies up to the extensive granite quarries and from taking down the rough stone to stone dressing sheds at the village, and for shipment abroad. Blocks weighing over 100 tons have been quarried. The railroad runs under 60 derricks and takes the granite produced by 34 different concerns. At the Wetmore & Morse quarry, which is called the most extensive quarry of the kind in the world, on a spur track having a maximum grade of 300 feet to the mile, an elevation of 1025 feet above Barre village is reached. The grade from the village to the highest point on the main line, $3\frac{1}{2}$ miles distant, averages 243 feet to the mile. The greatest rise on the main line is at the rate of 264 feet per mile.

BENNINGTON AND GLASTENBURY RAILROAD.

Line of Road.—From its connection with the Bennington and Rutland Railway, in Bennington village, to the mountain woodland in Glastenbury. Length of track, 10 miles, including 1 mile of sidings. Gauge, 4 feet 8 inches. Rails, iron, weighing 36 pounds to the yard.

History.—This road was built in 1872, for the transportation of forest products from the towns of Woodford and Glastenbury. It has not been operated for general freight transportation for several years. It is now owned in the interest of the Bennington and Rutland Railway Company, and is used only by the latter company for side-track purposes.

Inspections.—The road not being open to the public, it has not been inspected since the inspection of August 6th, 1892, which was reported in the last Biennial Report. The road-bed, ties, track and bridges are in such condition that heavy expenditures will be required before the road can again be safely operated.

BENNINGTON AND RUTLAND RAILWAY.

Line of Road.—From Bennington to Rutland, and from North Bennington to State Line, the main line being 57.06 miles in length and the line from North Bennington to State Line, 1.85 miles long, making 58.91 miles of trunk line, with 8.50 miles of sidings. Gauge, standard. Rails, steel, weighing 60 pounds per lineal yard.

History.—This road was chartered as the Western Vermont Railroad Company, November 5th, 1845. The portion between North Bennington and State Line was put into operation in July, 1852, connecting at State Line with the Troy and Bennington Railroad. Extension was made to Bennington village in 1854.

The road went under a trusteeship upon foreclosure of mortgage in 1857. In February, 1870, it was consolidated with the Lebanon Springs Railroad, under the name of the

Harlem Extension Railroad Company. The consolidated road was leased to the Central Vermont Railroad Company in 1873, but was surrendered back to the trustees under the aforesaid mortgage, and became reorganized under its present name. It has been operated by the Bennington and Rutland Railway Company since September 10th, 1877.

Inspections.—The inspection for 1893 was made September 20th, by Commissioners Davison and Bagley, and Clerk Watson, accompanied by officials of the railway company. The last inspection was made July 18th, 1894, by Commissioners Davison and Bagley, accompanied by E. D. Bennett, Superintendent, and A. G. Coomer, Road and Bridge-Master.

Numerous improvements have been made upon this road since the last Biennial Report, particularly with reference to strengthening the bridges to meet the requirements of the heavy rolling stock and loads now run. The Board deplors the continuance of the use of "horses" under so many of the bridges. These temporary expedients appear to be well put in, and as long as they are carefully looked after and kept in place, the carrying capacity of the structures is considered adequate. The cob-house bridge seats under several of the bridges, in lieu of substantial masonry and timber-work, convey an impression of a lack of permanency. Bridge No. 9, in Wallingford, which was tampered with by unknown persons for purposes of revenge or train robbery and wrecked by the night express train, September 6th, 1893, had been thoroughly repaired.

The ballast on this road is plentiful and of good quality. The ties are in good condition, some 60,000 new ones having been laid since our last report. As the new ones are laid, they are placed closer together than formerly, the rule now being 3,000 per mile. One hundred tons of new 60 lbs. steel rails have been purchased during the present season.

The requirements of law with reference to guard-rail blocking, cattle-guards, crossing signs, and cutting of weeds along the line, are well observed.

A new depot is being built at Clarendon in compliance with a recommendation of the Board.

The train service on this road is exceptionally good for the accommodation of both through and local passenger travel.

BRISTOL RAILROAD.

Line of Road.—From its connection with the Central Vermont Railroad at New Haven Junction to Bristol village, 6.26 miles, with .56 mile of sidings. Gauge, standard. Rails, steel, weighing 56 and 60 pounds per yard. The ties are laid 2,600 per mile.

History.—This road was chartered as the Bristol and Richmond Railroad Company, November 1st, 1890. Construction was commenced immediately, but was soon temporarily suspended because of lack of funds and other obstacles. The franchise passed into the ownership of the present management, by which the road was promptly and thoroughly constructed. The road was opened for public business January 5th, 1892.

Inspections.—The inspection for 1893 was made September 13th, by Commissioners Davison and Bagley, and Clerk Watson, accompanied by H. G. Smith, Treasurer, and J. J. Ridley, Director. The last inspection was made July 6th, 1894, by Commissioners Pingree, Davison and Bagley, accompanied by Treasurer Smith.

Many finishing touches have been put upon this new road since the last Biennial Report, and it is now in excellent condition. Several openings in the roadbed have been filled and additional ballast has been distributed. The absence of cattle-guards at several highway grade crossings was noted.

This road appears to be operated for the safety and convenience of the public and is liberally patronized for both freight and passenger traffic by the people of Bristol, Lincoln and Starksboro.

BOSTON & MAINE SYSTEM.

ASHUELOT RAILROAD.

Line of Road.—From South Vernon, Vt., to Keene, N. H. 24 miles, of which only .72 of a mile is in Vermont. Siding 3.79 miles, of which 1.69 of a mile is in this State. Gauge standard.

History.—Chartered December 27th, 1844. Commenced operating January 1st, 1851. Reorganized in 1877, with \$210,000 of capital stock and leased to the Connecticut River Railroad Company on the 21st of April of that year, under 99 years' lease at an annual rental of 30 per cent. of its gross receipts, recently amounting to 8 per cent. on the capital stock, which is all held by the Connecticut River Railroad Company.

Inspections.—Made September 13th, 1893, by Commissioners Davison and Bagley, accompanied by Wm. E. Clark, Bridge Master; and July 10th, 1894, by Commissioner Davison and Clerk Watson.

Extending as this road does, less than one mile in this State and over meadow land of tolerably even surface, it has no cuts or fills of much depth, nor are such necessary to get a uniform grade. The rails are all of 56 lbs. weight to the yard and run on ties that are sound and closely spaced. The roadbed, including ballast, the alignment of the track, and the fences are commendably good. It has but one depot, and that in connection with the New London Northern at South Vernon. This is rather small for a junction station, but is cleanly kept and is in a good state of repair. It has no entire bridge in the State, only about 100 feet of the Hinsdale bridge, which spans Connecticut River, being west of low water mark (State line). This bridge has a good factor of safety.

PASSUMPSIC DIVISION.

CONNECTICUT AND PASSUMPSIC RIVERS RAILROAD.

Line of Road—Extends from White River Junction to the Canadian line in Derby, Vermont, giving length of main line, 110.30 miles, with 34.38 miles of sidings. The rails are now all of steel, of 56 pounds weight per yard, from White River Junction to Wells River, 40 miles, and from Wells River to the Province line, 17 miles, of 60 to 79 pounds; 21 miles are of 73 to 79 pounds, and the remainder of the way, they are of 56 pounds weight.

History.—The Connecticut and Passumpsic Rivers Railroad Company was chartered October 27th, 1843, but the road was not completed and in operation throughout until 1863.

The company leased the Massihippi Valley Railroad, July 1st, 1870, thereby extending its line to Lenoxville, P. Q., 34.75, with 2.40 miles of spur track, reaching from Stanstead Junction to Stanstead, P. Q., and Derby Line, Vermont. This lease is for the period of 99 years, and connects this line with the Grand Trunk, Quebec Central and Canadian Pacific Systems, making the entire length of this Division 147.50 miles. January 1st, 1887, with its leased lines, it was leased to the Boston and Lowell Railroad Company for the term of 99 years and passed with its lease of the latter company, April 1st, 1887, into the Boston and Maine System, under a lease for the same period, since which it has continued to be operated by that corporation as its Passumpsic Division.

Inspection.—This line was inspected August 1st, 1893, by Commissioners Pingree and Davison and Clerk Watson, accompanied by H. E. Folsom, Division Superintendent; E. C. Spaulding, Bridge-Master; and William G. Roberts, Road-Master; and in 1894, June 25th, by the same Commissioners, Road and Bridge-Masters, with David Williams, Assistant Engineer.

Starting from White River Junction, this road pursues a nearly due north course along the Connecticut river valley,

until it reaches East Barnet, where it leaves the Connecticut and emerges into the valley of the Passumpsic, and then runs along the meadows bordering that stream until near West Burke. From a point a short distance north of Lyndonville, it rises at rather a sharp grade fourteen miles to the "turnout" known as the "Summit." Leaving the "Summit" and continuing north, it descends rapidly about an equal distance, until near Barton Landing, where the grade again becomes easy and so continues until the Canadian line is reached. Approaching the "Summit" in either direction are found the only long and heavy grades upon the road.

Following as it does the valleys of the Connecticut and Passumpsic rivers for a distance of about eighty miles, it encounters and crosses all the mountain streams that descend to the east to unite with the former, and after leaving the river in ascending to the north, it often comes in contact with the Passumpsic and many of its tributaries, thereby compelling the erection and maintenance of many bridges. They number more than one hundred, but of this number only three can properly be termed long, and only four remarkably expensive to construct. These are the iron bridge at White River Junction, the Abbott arch in Barton and the two pile bridges spanning the lake at Newport. They are all of approved but various designs, the pin lattice predominating among those of any considerable length.

With the exception of the Pompanoosuc bridge, a pin lattice, built in 1852, and a Howe truss near Passumpsic, built in 1864, all are considered adequate to stand the stress, with a large factor of safety, of any rolling load that will be hauled over them by the motive power now in service on the line.

The two excepted bridges, although as yet showing no special signs of weakness or decay, we were informed by Bridge-Master Spaulding, are to be rebuilt the coming season.

The masonry upon which the new bridges rest is exceptionally good, being composed of heavy stone blocks and laid in

cement, while that under the old ones, though somewhat rough and coarse, still stands erect and unimpaired.

The rails were found generally in good condition, the alignment of the track excellent, the elevations of the curves remarkably well adjusted, and so well have tie renewals been made that scarcely an unsound or decayed tie was noticed on the entire length of the main line.

Up to the time of the inspection in 1892, the improvements on the roadbed had not kept pace with the improvements in the department of buildings and bridges, but since that time there has been steady progress made in this line of work, and now, instead of an almost continuous want of ballast, long stretches of wide top surface heavily ballasted are found, and, if the same work shall be continued, it will require no long time to place the roadbed of this line among the best in the State.

Speaking in a general way, the station accommodations are ample and the sanitary arrangements good. Many of the old stations have been recently renovated and repaired by the laying of new floors, sheathing the waiting rooms, building awnings and low, long platforms, thereby lending attractiveness to these structures and safety, comfort and convenience to the traveling public. Several new ones have been built, and when this has been done, these buildings are not only elegant in design, but are handsomely finished, large and convenient, and have all the modern appointments, such as running water, steam or furnace heat and water-flushed closets. A new station is now being erected at Barton Landing, and when this is completed but little criticism can be justly directed against much the greater number along the whole length of this road.

All station and grade crossing signs were found in place, and well painted and distinctly lettered.

Though not all of the regulation standard, the fences are good and are kept well repaired. The weeds, bushes and grass along the margins of the roadbed are not always cut as early as the law requires, when other and more important

duties have been performed, but it has been observed that this work has been attended to later in the season. On the whole, this road has made very noticeable betterments, even during the last two years of business depression and decreased earnings, and, while there still remains much to be done, there always will be in all departments of railroad maintenance, when it shall have completed the ballasting of its road bed up to the standard now prevailing, this railroad will be entitled to take rank among the very best in the State.

The following letter in regard to the Bugbee and Barnet bridges was received by the board, May 1st, 1894:—

BOSTON AND MAINE RAILROAD.
PASSUMPSIC DIVISION,
SUPERINTENDENT'S OFFICE,

LYNDONVILLE, VT., April 30, 1894.

A. E. Watson, Esq., Clerk R. R. Commissioners, Hartford Vermont

DEAR SIR:—Referring to report and notice of the Board of the matter of fatal accident to O. M. Wilmot, January 21, 1894.

I desire to now advise the Board that the Bugbee and Barnet bridges, referred to in said Report, have been changed in width so as to comply with the amended statute, governing in such cases.

Yours truly,

H. E. FOLSOM,
Superintendent.

VERMONT VALLEY RAILROAD.

Line of Road.—From Bellows Falls to Brattleboro, 23 miles; sidings, 5.35. Gauge, standard. Rails, all steel, 56, 60, 70, 72 pounds weight per yard.

History.—Chartered November 8th, 1848, and commenced operating in 1851. May 12th, 1865, passed into the hands of trustees, for ten years, at a yearly rental of \$60,000. In January, 1871, this lease was transferred to the Rutland Railroad Company, by which company it was operated until

April 5th, 1877. It then became a part of the Connecticut River System, by which it was operated until it passed into the hands of the Boston and Maine by lease, dated January 1st, 1893.

Inspections.—In 1893, the inspection was made by Commissioners Davison and Bagley, accompanied by William E. Clark, Road and Bridge-Master; and in 1894, July 11th, by Commissioners Pingree and Davison, and Clerk Watson, and by the same Road and Bridge-Master as in 1893.

The solid and substantial manner with which the roadbed of this road was first constructed renders its maintenance easy and inexpensive, and the care it has received has kept it up to a high state of preservation. The top surface is broad and gives ample room for ballast, which is found in abundant quantities along the entire line. Though some of the rails have been in service for the last twenty-four years, they are not badly worn or battered.

Two and one-half miles of these old rails are to be taken up and replaced with rails weighing 75 pounds to the yard, during the present season. The Saxton's river and the West river bridges are the only long ones on the road, and these and all the other bridges are of iron with a good factor of safety, and are supported by heavy stone masonry laid with skill and good judgment. The fences are exceptionally good. Station signs that were wanting at Putney and East Putney in 1893, have been replaced, and the three overhead bridges of less than twenty feet clear height, and at which no tell-tale warning signs had been erected at the time of the inspection in 1893, have been raised, and now meet the requirements of the law, requiring all bridges built or rebuilt to have a clear height of twenty feet.

The ties are closely spaced, being 3,000 to the mile, and give ample support to the rails, while the quality and life of the same require no adverse comment.

The depots are of ancient or medieval design and construction, are neatly kept and sufficiently large to accommodate the localities that they were designed to serve. Switches,

frogs and guard-rails are kept blocked with care, and the seasonable attention paid to clearing the margins of the road of weeds, bushes and grass is highly commendable, and should preclude the fault-finding of the most fastidious.

On the whole, this road, for physical condition, train service and general management, deserves to rank among the best in the State.

ST. JOHNSBURY AND LAKE CHAMPLAIN RAILROAD.

Line of Road.—From Lunenburg to Maquam Bay, 120 miles, main line; and Victory Branch, from North Concord to East Haven, 11.1 miles; Hardwick Branch, 1.5 mile. Total line operated, 132.6 miles. Sidings and yard track, 18.42 miles. Gauge, standard, 4 feet 8½ inches. Rails, steel, 123.30 miles 56 and 60 pounds weight; Victory Branch, iron and steel, 5 pounds.

History.—This railroad is a union of the lines of three separate companies originally, namely, the Essex County Railroad Company, chartered in 1864, amended 1866; Montpelier and St. Johnsbury Railroad Company, chartered in 1866; and the Lamoille Valley Railroad Company, chartered in 1867. Consolidation was effected by the three companies jointly bonding their property, but failing to pay the interest on bonds, all the roads went into receiver's hands in 1877, the year that it was opened for business.

The road was first operated as the Portland and Ogdensburg Railroad, Vermont Division. It was reorganized under the name of the St. Johnsbury and Lake Champlain Railroad, January 31st, 1880, and commenced to be operated under this name July 1st, 1880, and so continues to the present time.

The Victory Branch was constructed to the lumber districts in Victory, Granby and East Haven in 1882-3, to afford facilities for the transportation of the large quantities of lumber manufactured in these towns. It was built by the St. Johnsbury and Lake Champlain Railroad Company, by which it has been and is owned and operated.

Inspections.—Made August 2nd, 1893, by Commissioners Pingree and Davison, and Clerk Watson, accompanied by H. E. Folsom, Superintendent; E. H. Blossom, Assistant Superintendent; Charles E. Severance, Road-Master; and George Gibbons, Bridge-Master.

Inspection in 1894 was made June 26th and 27th, by the same Commissioners, with E. H. Blossom, Assistant Superintendent; A. J. Corriveau, Train Dispatcher; E. C. Spaulding, Bridge-Master; and David Williams, Assistant Engineer.

If comparison is made of improvements accomplished on this road during the past two years with those that were made during the preceding biennial term, they will appear notably less, yet of much value and importance as regards the safety of its trains and the accommodation of the public. In no department have the conditions been permitted to grow worse, while in the department of bridges and buildings, positive progress has been made in the way of lasting betterments. The undertakings under way and prominent, but incomplete in 1892, are now finished. Fisher's trestle in Danville has been filled; the double, stone waterway in the same town, the Elmore brook bridge in Wolcott, the stone arch near the Tenney bridge in Morristown, the fill at Walden high trestle, unfinished at the time of inspection in 1892, and a new Howe truss bridge of two spans and of standard strength, 100 feet long, at East St. Johnsbury, have all been wholly built or completed within the last two years. Two new depots have also been constructed at East Fairfield and Sheldon, in compliance with the recommendations of the Board, upon petition and hearings; the one at East Fairfield being large, roomy, well planned and well finished, and the one at Sheldon, though smaller, being equally as good and fully adequate to accommodate the smaller business done at that station. The depots at Highgate and East Highgate still remain, conspicuous and decaying relics of other days. They are of such a character and state as not too commend themselves to the public, are open to justifiable criticism and condemnation, and should be abolished at the earliest

practicable day, and new ones erected in their stead. Otherwise the stations on this road are all fairly good, and a few, some of which have been mentioned, are of a high standard of excellence. With an occasional exception, they are kept commendably neat and clean. No essential changes have been made in the long bridges during the past two years. They were all originally of the Howe truss design, and light for the rolling stock of the present day; but, as many of them have been strengthened in one way or another and all receive the vigilant care and supervision of Bridge-Master Spaulding the Board does not deem them unsafe, unless heavier engines are substituted for those now in use. The roadbed, when first built was faulty and imperfect, lacking depth and width and the ditches were shallow and the ballast thin and scant. These defects have been partly remedied by widening the top surface with gravel, but much more of this material indispensable to a first-class road, is still wanting. The rails and ties were found in fair condition; six thousand of the latter were put in last year, and many new ones were observed scattered along the track, which the section men were placing at the time of the last inspection. Cattle-guards and fences were both, in a large measure, found wanting from Lunenburg to East St. Johnsbury. From St. Johnsbury west to Maquam, both of these requirements are better, though not perfectly fulfilled. A limited number of split switches have been introduced, and the switches, frogs and guard rails were found blocked, but some of the blocks will soon need renewal on account of wear and decay. When this road came into the hands of the present management, it was in a state of deterioration. At that time many trestles, some of them of dizzy height, with timbers weak from decay, existed along this line. The roadbed was flat and largely destitute of ballast. Many of the ties were soft and worn. A portion of the rails were battered and the joints were low. Since then the high trestles have been filled and low ones have either been rebuilt or repaired, and are now comparatively safe. Large renewals of ties have been made, and the

tered rails taken up and new ones substituted; and on the whole, while much remains to be done to raise this road to a first-class condition, yet so much has been accomplished in the short time that it has been under the present management, that it almost disarms criticism. The original order, as modified by the supplementary order of the Board in respect to the abolishment of one of the grade crossings on Jason Cole's farm, in Danville, was found to have been complied with at this inspection.

CANADIAN PACIFIC SYSTEM.

NEWPORT AND RICHFORD RAILROAD.

Line of Road.—This road has its termini at Newport and Richford, and there are 21 miles of the same in Vermont, with about six miles of side track. The gauge is standard. The rails are all of steel of 56 and 60 pounds weight to the lineal yard. The ties are laid 3,000 to the mile.

History.—This road, which was chartered and constructed as the Missisquoi and Clyde Rivers Railroad, was sold to the Newport and Richford Railroad Company in 1880, and is now operated by the Canadian Pacific Railway Company, which leased the same, June 29th, 1881, for 99 years.

Inspections.—In 1893, July 27th, by Commissioners Pingree and Davison, and Clerk Watson, accompanied by F. P. Brady, Assistant Superintendent; Joseph D. Clark, Bridge-Inspector; Gavin Shanks, General Road-Master, and F. E. Alfred, Esq., solicitor for the company. In 1894, June 30th, by the same Commissioners, accompanied by Assistant Superintendent Brady, and Road-Master Shanks.

The roadbed is found of good width and well ballasted from Newport Center to Richford, but with a deficiency of ballast from Newport to Newport Center. At the inspection in 1893, the work of ballasting the east end of the line was progressing with the prospect of its completion through to Newport before suspension, but it is now claimed by the officers of the company that the prosecution of this work had

to be suspended for want of earnings beyond the limit of service necessary for the safety of the traffic, and because the large force of workmen was demanded in other parts of their great system. The result, whatever the cause, has been the entire suspension of ballasting this much neglected end of the line.

The renewal of the ties and rails and keeping the track in a fairly safe condition is noted. The old St. Albans steel rails have given place from year to year to the Scranton steel of 60 and 72 pounds weight to the yard. The switches and guard-rails are kept in a fair condition of blocking. The fences are excellent. The crossing signs are well displayed, and the cattle-guards are of the modern surface types, and are of two distinct patterns.

There are several re-railing switch devices on this line.

The station houses are old-fashioned and very plain, but are spacious and well looked after and appear equal to all needed service.

Bridges.—The great pile bridge across the arm of the lake at Newport has been filled up, and, save an opening of 150 feet, for navigation, the roadbed is completed in earth dump across the arm of the lake and now lacks only ballast, which is to be placed as soon as the earth is compactly settled to receive it. This took 95,000 cubic yards of earth and cost \$19,000.00.

The "Summit" trestle has been considerably renewed and strengthened as to its piling, mud sills and timbers, while the old high trestle just east of Newport Center has been filled with earth.

The trestle bridge at North Troy,—the highest structure of its kind now left in the State,—still spans the stream and chasm there, though its construction was claimed to be but temporary four years ago, and was to be replaced by an iron structure. The Board deems this bridge safe only for trains moving at a slow rate of speed, and, as this cannot at all times be assured, the lofty trestle should be replaced by a permanent bridge of safer structure.

CENTRAL VERMONT SYSTEM.

CENTRAL VERMONT RAILROAD.

Line of Road.—This system consists of a main line running from Windsor to Rouse's Point, with leased and operated lines as follows, viz.:

Addison Railroad, Brattleboro and Whitehall Railroad, Burlington and Lamoille Valley Railroad, Missisquoi Valley Railroad, Montpelier and White River Railroad, New London Northern Railroad (ten miles in Vermont), Rutland Railroad, Swanton Branch Line (Swanton Junction to Province line), all within this State, and being 436.90 miles of main line, together with about 375.1 miles of road outside of Vermont and making the aggregate main line mileage 811 miles. The Central Vermont Railroad proper has 85 miles of sidings, etc., and 202 on all roads operated within and without this State.

History.—The Central Vermont Railroad is an outcome of the Vermont Central Railroad Company, which was chartered in 1843 to build a road from Windsor to Burlington. The same was completed and opened to travel by December, 1849.

A road called the Vermont and Canada was chartered in 1845, extending from Essex Junction to Canada line. This road was leased before completed to the Vermont Central Railroad Company for fifty years, at an annual rental of eight per cent on its cost. It was practically an extension of the Central Vermont road, the Vermont Central giving a mortgage of its properties as security for the payment of this rent, amounting to over \$107,000 per annum, the construction cost of the Vermont and Canada being \$1,348,500.

The Vermont Central issued \$2,000,000 first mortgage bonds, and \$1,500,000 second mortgage bonds; the first in 1851, and the second in 1852, to meet its pressing obligations. But embarrassments of the company increasing, a trusteeship was instituted and the road and its properties were placed in the hands of trustees of the first mortgage bonds, and was operated by said trustees until 1854; when, being unable to

pay the rental to the Vermont and Canada, that road, by the terms of the contract between them, took possession of the Central road as receiver, and operated the system until its arrears of rents were realized, and then surrendered it back to the trustees, who were now clothed by the Court of Chancery with the powers of receivers under the law.

Under the management of the receivership, and with the sanction of the Court constituting it, the capital stock of the Vermont and Canada road was increased to \$2,000,000; and thereby the overdue rents were reduced and funded.

It was also arranged that after payment of the annual rental out of the income of the property, funds should be used for the construction of a branch road from Swanton Junction to Province line in Highgate; and a new increase of capital stock was made on the Vermont and Canada road of \$250,000. In 1867, another \$250,000 was added for like purposes, and in 1871, \$500,000 more; increasing the capital stock of that road to \$3,000,000.

The funds raised by this increase of stock were used to fund a debt of \$114,500 due the Vermont and Canada road, to pay dividends, and to extinguish other obligations.

In course of a few years after this, the trustees had extended their system by the purchase or leasing of the following named roads: to wit,—

The Stanstead, Shefford and Chambly road, from St. John's to Waterloo, P. Q., had been bought for \$500,000, being forty-three miles of road.

The Rutland Railroad and the Addison, and also the New London Northern, had been leased for twenty years. Later the Montpelier and White River Railroad came under its control, as did also the Brattleboro and Whitehall Railroad.

The Central Vermont Railroad Company was organized in 1872, and took charge of all the above named roads in 1873 as receiver, and continued to operate the system until 1884 when the receivership terminated.

The great legal controversies between the Vermont Central and the Vermont and Canada tended to the ruin of both com-

panies; wasting their incomes, and burdening their receivership with an indebtedness of many millions of dollars.

This indebtedness the Court adjudged to be a lien upon the properties of the Central Vermont Railroad Company, having preference over the rental due the Vermont and Canada Railroad Company; and upon the payment of these preferred claims, the Court decreed that the Vermont and Canada Railroad Company be entitled to the possession of the roads of the Central Vermont Railroad Company.

The Court later (in 1882) determined the order in which the various claims of creditors of these two roads should be liquidated.

The debt contracted by the receivers and managers,—nearly \$8,000,000, should be a first lien on the properties; and was adjudged to be treated as in equity the first mortgage on all the properties of the Vermont Central and Vermont and Canada Railroad Companies.

It also decreed that the Vermont and Canada Railroad Company, and the two classes of mortgage bondholders above named, should, within a time limited, pay and discharge this first lien, or be foreclosed of all right or claim on the property.

Then, in 1883, the Consolidated Railroad Company of Vermont was organized, to assume the properties and debts, and formulate a plan for terminating litigation and sealing and settling claims of security holders.

The plan was carried out. First, by an issue of \$7,000,000 five per cent bonds running thirty years, secured by first mortgage on the properties of the Vermont Central and Vermont and Canada Railroad Companies. Second, by exchanging these bonds for the original stock of the Vermont and Canada, \$1,000,000 of the new bonds being taken for the \$3,000,000 of stock. Third, by buying up through exchange Stanstead, Shefford and Chambly bonds, and other preferred claims of different security holders, paying \$4,357,000 of the consolidated bonds in exchange for a like aggregate amount of the old claims; all arrears of interest being waived by the holders. Fourth, by dividing the balance of these bonds

(\$1,643,000) to retire the floating debt of \$1,000,000 and other indebtedness of the trust, including the claim of the Central Vermont Railroad Company, amounting to \$643,000. Fifth, by issuing preferred capital stock of the new company to the amount of \$750,000 and exchanging the same at the rate of twenty per cent for the first mortgage bonds of 1851, and ten per cent of the second mortgage bonds of 1852 at face value, and all arrears of interest waived.

This stock bears six per cent dividends annually, if the earnings of the company reach it, after paying its preferred obligations.

July 1st, 1884, the property was turned over to the Consolidated Railroad Company of Vermont, and was by it on the same day leased to the Central Vermont Railroad Company for ninety-nine years; the latter corporation assuming all the obligations of the Consolidated Company by the terms of the lease.

Inspections.—Made September 11th, 12th, 13th, 14th, 1893, by Commissioners Pingree and Davison, and Clerk Watson, accompanied by J. W. Shanks, Road-Master; A. L. Davis, Assistant Engineer, and Jesse O. Olmstead, Assistant Bridge-Master; and in 1894, July 5th, 6th, 7th, by the full Board, accompanied by F. W. Baldwin, General Superintendent; O. H. Stevens, Division Road-Master; and Jesse O. Olmstead, Assistant Bridge-Master.

The inspection both years began at St. Albans, and the Northern and Western Divisions were first taken up.

The immediate inspection report relates to the trunk line of this system between Province line on the Northern Division and New York State line on the Ogdensburg Division, uniting at Swanton Junction, on the north and Windsor on the south,—the other lines operated by this road as a part of its system being reported separately and following the report of the trunk line.

The roadbed and track of the Western and Northern Divisions beyond Swanton Junction are found to be in fair condition,—the ballast well kept up and the ties well renewed.

The road surfacing was also found in the main in a good state, and all much improved over the condition of two years ago.

That part of the line between Swanton and St. Albans is a broad and model roadbed and the same together with the double track on this link of the line is excellent in ballast, steel, surfacing, fencing and ditching, and most that goes to make up a modern standard railroad track. The steel of this double track is Scranton, seventy-five pounds weight to the yard, and the same has been placed within the present biennial term. The renewal of ties has not been so extensively attended to the past year throughout the line as has been shown at former inspections, many being old and beyond good life.

The greatest work of permanent improvement on this line is the replacing of the Georgia bridge by a standard riveted lattice bridge 600 feet in length, and 80 feet from the deck to the river bed. It is just completed.

The greatest want observed on this generally excellent road, from Essex Junction north and west and to Burlington, is a more general renewal of ties.

As to that portion of the road between Essex Junction and Windsor, there are still to be found several bridges of early build, which have for many years been strengthened by being "horsed up." Whenever these bridges have been rebuilt they have been made safe and strong, generally being replaced with riveted lattice or iron girder structures.

It is conceded by all railroad bridge engineers that the greatest element of danger to the bridges sustained by "horses," is the great liability to displacement of these false piers by freshets and the ice and flood-wood jams coming against them, while if not so disturbed, they are claimed to render the bridge safe and strong. They call for the most constant watchfulness, and are never safe from these disturbances.

The number on this line is diminishing too gradually. The ties between Essex and Montpelier Junctions have been liberally renewed in the last year, considerably over

10,000 having been laid, while but little has been done in renewal of ballast in the last biennial period between these junctions. Safety has demanded the renewal of ties rather than of the ballast. This division is found to be, in the main, well surfaced and policed at both inspections. Cattle-guards, fences and safety blocking are in excellent condition.

The rails are 75 and 72-pound steel throughout.

The station at Bolton is old and unsightly, small, floor badly worn and every appearance untidy, with no water closet on the premises.

The Waterbury link and pin bridge was found to be "horsed up" with wooden piers to supplement its carrying power, on account of its structural weakness. This is the only instance of the "horsing up" of an iron bridge which the Board has discovered. It is an unsafe bridge and should be replaced by an adequate structure.

Dog river bridges Nos. 2, 4, 5 and 6 have been rebuilt with iron plate girders, 110, 110, 102 and 110 feet long, respectively,—while No. 3 still stands on "horsing up" supports.

The station at Northfield, heretofore reported as filthy, has been well renovated, and is this year found to be tidy, and neatly cared for, newly painted inside the waiting rooms and having flushed closets and whitened interior walls throughout.

The Harlow bridge is supported by four "horses;" at the approaches the ties are badly spaced, the floor has no safety-guard timbers, and the bridge has an appearance of insecurity about it. It should be rebuilt as soon as possible.

The three long deck bridges in Bethel, Royalton and Sharon, over White river, are unchanged from the last reports and are claimed to be safe. They have good floor systems and are protected by well-fastened safety beams. Their construction is of the standard carrying power of many years ago, although the two long ones (Royalton and Sharon) are strengthened by good arches in every span. All long bridges south of the Sharon bridge, except the one at North Hartland, are of iron and of recent construction. They are all strong

bridges except the one over Lull brook in Hartland, which is used under special regulations for the slowing of trains passing over it.

The West Hartford station is out of condition in all respects; it is too small, is badly located with reference to the sidings as now placed, and with disagreeable closet facilities. Its conveniences and accommodations for the public are now under special consideration of the Board, upon complaint of citizens of the vicinity.

At the upper Ford crossing in Braintree, the Board noted at its inspection that the old highway had been duly closed as ordered, and another great danger to travel has thereby been removed.

In summing up the findings of the Board upon the two inspections of the term, it may be said that, as a whole, the condition of the roadbed, depots, and bridges in particular, have undergone a gradual and continued improvement, and at no point throughout the line has there been found serious neglect or deterioration in the maintenance of a reasonably safe and creditable roadway, and conveniences and facilities adequate to the public needs.

The Board also found on inspection that its recommendations made in the petition of W. H. Nichols and others, reported in Vol. 3, pages 321-2, had been complied with by the railroad company.

Each inspection has disclosed a marked improvement in the physical condition of this great trunk line of the State. Eight years ago, it could not be rated as a first-class line of road, even though measured by the inferior standard of that day. Its iron was light, much of it was of poor quality, its ballast was lacking, its ties were widely spaced and badly worn, its roadbed lay low and subject to the action of the frost. The fencing, ditching, crossing-signs, cattle-guards, safety blocking and warning appliances were deficient or not in use.

These needs have generally been supplied and are steadily being increased and improved.

The track is wholly in steel of 60 pounds weight and upwards to 75 pounds.

Many bridges have been rebuilt, and always of the standard type.

New and always neat and commodious depots have been built, and old ones in many instances have been renewed and made suitable in comfort, convenience and taste.

A few more new or remodeled old ones are still needed, and a constant progression in the line of new iron bridge construction is necessary until the "horsed up" bridges all disappear from the line. It is the expressed policy of the department of bridges and depots, that this work of renewal shall continue till its bridges and station-houses are standard throughout.

ADDISON RAILROAD.

Line of Road.—From Leicester Junction (on the Rutland Railroad) to Ticonderoga, N. Y., 15.6 miles, with 1.75 mile of sidings. The rails are of 60 lbs. steel for about 14 miles, and are wrought iron for the rest of the way. Gauge, Standard.

History.—Chartered in 1870. Opened, December 1st, 1871, and immediately leased to the Rutland road and transferred with the latter under a twenty years' lease to the Central Vermont Railroad Company, and since operated by the management of the last named company, the Rutland Railroad having been leased again for a term of 999 years on December 31st, 1890.

Inspections.—September 13th, 1893, by Commissioners Davidson and Bagley, and Clerk Watson, accompanied by Messrs. Baldwin, Shanks, Burdett and Roys;

And July 6th, 1894, by the full Board, accompanied by General Superintendent Baldwin, Division Superintendent Burdett, Bridge-Master Roys, General Road-Master Shanks and Division Road-Master Sheehan.

This 15.6 miles of road is taken care of by a force of fifteen men.

It is claimed by Messrs. Burdett and Roys that this line today, with all its imperfections, is a better line of railroad than some of the Burlington and Rutland line was ten years ago.

It has undergone much improvement since its first inspection.

Originally laid in wrought iron rails, it is now all 60 pounds steel except about a mile and a half. Its tie system is generally found good, renewals having been frequent and recent.

Its roadbed has been broadened on several of the fills concerning which adverse comment was made in the first Report of the Board. The surfacing and policing has been better attended to than on most of the leased lines of this system.

Its chief deficiency now appears in its lack of sufficient ballast and breadth of fills to carry and keep it in place.

The road is also faulty in being without cattle-guards at most of the highway crossings. This road was well laid out. There are no sharp curves and the grade is not severe at any point.

Crossing-signs are all up and safety blocking is in where the law requires.

The bridges are few and short, but are believed to be equal to the strain which the light traffic of the road exacts.

The depots are not of the modern style, but are neatly kept and are not badly worn.

The one at Shoreham needs leveling up and a better foundation to rest on, and the plastered walls need repairing.

The Baldwin dry bridge still presents a distrustful appearance; but, upon a careful inspection, its abutments are believed to be firmly held in place for the present by the heavy shorings.

The line is subjected to the traffic of but a single train each way, daily. This is the passenger, mail and freight train going east in the morning and back in the evening, and its schedule of speed is limited to not exceeding fifteen miles per hour.

BRATTLEBORO AND WHITEHALL RAILROAD.

Line of Road—From Brattleboro to South Londonderry, miles, with 3.50 miles of sidings. Gauge, narrow—3 feet.

History.—This road was chartered in 1867 under the name of the West River Railroad Company, and was re-chartered in 1876, under its present name.

It was leased to the New London Northern Railroad Company, a short time before its completion in 1880, for the term of 99 years, and is now operated by the Central Vermont Railroad Company, which leased the New London Northern Railroad December 1st, 1891, for the term of 99 years, carrying with it its leased lines.

The road was completed and opened for traffic November 3d, 1880.

Inspections.—September 15th, 1893, by Commissioners Davison and Bagley, accompanied by Messrs. Baldwin, Shanks, Beeman, and Olmstead; and July 11th, 1894, by Commissioners Pingree and Davison, and Clerk Watson, accompanied by Messrs. Shanks, Olmstead, and Beeman.

The physical condition of the road was found upon both these inspections to be substantially unchanged from its condition as represented in the last Biennial Report. Indeed no road in the State has held its own much better than this.

No new station house has been built, and no old one has been changed by any material repairing, ordinary or otherwise. Neither rebuilding or extraordinary repairs are demanded, as none of these depots have had over fifty years of service, and in that period they have been apparently carefully looked after and not subjected to hard use, the travel being light in this not densely populated portion of the county.

It may be said that the station houses are all decently and generally tidily kept.

They are sufficiently commodious and otherwise convenient to the wants of the public; the one at Williamstown being especially neat, airy and pleasant.

The roadbed is one of most remarkable curves, both in frequency and sharpness, and several of these are to be found at unfortunate points, as entering upon and extending over bridges or trestles.

The one most noticeable approaches the West Dummerston, Howe truss, deck bridge on a curve of 26 degrees, and the curvature at several points exceeds 30 degrees, and at one place it is 36 degrees.

The lack of sufficient ballast is noticeable as heretofore, but little new ballast having been supplied in the last two years.

The ties are sufficient in spacing, being 2,700 to the mile, and they are kept in fair renewal and appear in good life in most places.

The roadbed is sufficiently broad, and the fills are well shouldered for a narrow gauge road.

The switches are of the stub pattern, but these, together with the guard-rails and frogs, are kept well blocked.

The crossing-signs are in place, but several are not legible, and all are of the old design. Cattle-guards and fences are wanting in many places.

The bridging, with slight exception, remains unchanged.

The Salmon Hole bridge was built new three years ago with a long trestle over the highway at the south end. This trestle has now been filled up to the highway, close to the bridge, and the embankment is sustained by an excellent face and wing wall.

Trains are run on a safely timed schedule, and this road as a whole is deemed reasonably adequate to the convenience and safety of the public.

BURLINGTON AND LAMOILLE VALLEY RAILROAD.

Line of Road.—From Burlington to Cambridge Junction, where it connects with the St. Johnsbury and Lake Champlain Railroad. Main line, 26 miles; sidings, 1.875 mile. The use of that part of the line between Burlington and Essex Junction has been discontinued.

History.—Organized under the general laws of this State February 24th, 1875. Construction was commenced the same year and the road was finished so as to run trains in 1877. It commenced to be operated July 2nd, 1877. Began running over the Central Vermont line between Burlington and Essex Junction, June 1st, 1880. The distance from Essex Junction to Cambridge Junction is 26 miles; the distance from Burlington to Essex Junction on the Central Vermont line is 4 miles. This road was leased to the Central Vermont Railroad Company for a term of 99 years from May 1st, 1889, by which said company it is now operated.

Inspections.—September 12th, 1893, by Commissioners Piessie and Davison, and Clerk Watson, accompanied by Messrs. Shanks, Olmstead and Daily; and July 5th, 1894, from Essex Junction to Cambridge Junction, by the full Board, accompanied by J. W. Shanks, General Road-Master; John A. Day, Division Road-Master, and Jesse O. Olmstead, Foreman of Bridges and Buildings.

This railroad is laid in 56 pounds steel throughout its 26 miles, except $2\frac{1}{2}$ miles at its westerly terminus, which is 56 pounds wrought iron, the same as found by the Board two years ago. The roadbed is built largely as a surface bed, cuts, fills and bridges being very few, the conformation of the country being generally level. The "piking" up was fairly well done originally, but the ballast is deficient in the extreme in quantity, though the quality is good, and good ballast is obtainable on the line of the road in several places.

The ties are in a fair state of renewal, 6,400 renewals having been placed this season thus far. But little progress has been made in the proper fencing of this line of road; much of the way there is not and never has been any fence at all.

How much of this condition is the result of arrangement with the adjoining land owners does not appear, but no complaint has come to the Board on account of lack of fences on the line since the Commission was established.

Cattle-guards are the exception rather than the standing order. Those found are mostly of the pit type and are ade-

quate to the same degree as elsewhere, although the beveled wooden slat guard is in in two or three places. The surfacing is poor, and the weeds were uncut as heretofore.

A force of fifteen men is employed on this road for its maintenance.

For a line well ballasted and kept policed heretofore, this working force would be sufficient to present a clean, well-surfaced and policed roadbed and track, but wanting in these conditions, it is an inadequate number of section men. The weeds get and keep the start of them. The surface is covered much of the way with vegetation. Next to the Missisquoi, this roadbed has the appearance of being the most incomplete in its taste and care of any railroad in the State.

But in matters more necessary for the safety of the public travel and for the convenience of its patrons, its condition is more favorable.

Its ties are in good condition. They are closely spaced, being 3,000 to the mile, having been increased to this number from an original of 2,600 to the mile, and are kept in a reasonable state of renewal.

The blocking of frogs, switches and guard-rails is well provided and is kept good.

The depots are of convenient design and are kept in a good state of cleanliness and repair, although the sanitary conveniences and accommodations are neglected.

The bridges are generally trestles, low and long, and could mostly be filled with earth dump and converted into permanent roadbed. This has been done in the last year to the Jericho curve trestle of 150 feet span.

The Robinson trestle has been extensively renewed since the last Report, and the McClure trestle is of a bad floor system, the ties being too widely spaced, inviting wreck to follow derailment. It ought to be displaced by a fill with earth roadbed. Jeffersonville bridge (No. 1) needs an entire new floor system.

MISSISQUOI VALLEY RAILROAD.

Line of Road.—Extends from St. Albans to Richford, where by a spur track seven-eighths of a mile in length, it connects with the Canadian Pacific System. The length of the main line is 28 miles, with 3.5 miles of sidings. The track is standard gauge.

The rails are all steel of 56 pounds weight to the lineal yard, with the exception of about 5 miles which are iron.

History.—This road was built in 1872, at a cost of \$720,000. In July, 1883, it was leased to the Receivers and Managers of the Vermont Central Railroad Company and subsequently was transferred to the Central Vermont Railroad Company upon the reorganization under this name. This latter corporation continued to operate the road until November 15th, 1877, when it was surrendered to the mortgage trustees who operated it until December, 1886. The present company was organized in December, 1886, with a capital of \$500,000 issued in exchange for the bonds and coupons surrendered. It was leased to the Central Vermont Railroad Company, July 1st, 1888.

Inspections.—September 12th, 1893, by Commissioners Piessie and Davison, and Clerk Watson, accompanied by T. M. Deal, Division Superintendent; J. W. Shanks, General Road-Master, and J. O. Olmstead, Foreman of Bridges and Buildings; and July 5th, 1894, by the full Board, accompanied by T. M. Deal, Division Superintendent; J. W. Shanks, General Road-Master; Arthur McKinney, Division Road-Master; and Jesse Olmstead, Foreman of Bridges and Buildings.

This line of 28 miles is ironed as follows, viz.: 2 miles and a small fraction is laid with 56-pounds wrought iron rails, a little over 1 mile is laid with 50-pounds wrought iron, and the balance is 56-pounds steel, all second-hand, and considerably worn. 553 feet of new steel have taken the place of an equivalent length of old iron since the last inspection.

The roadbed and track are imperfect in many places. Proper surfacing and ditching are lacking and the ballast is very deficient; the grass and weeds grow rankly through

the ditches, along the sides, and up to and between the ties and rails in many places and much of the way.

There are many of the ties which are growing tender and need replacing by new ones.

The spacing is 2 feet from center to center, or 2,640 ties to the mile,—sufficient for the light traffic of the road, if kept in fair life.

Sixteen section men do the entire work of the road.

In respect to taste and general appearance, this force is believed to be sufficient to present and keep this line cleaner and better weeded, and surfaced.

Safety and perfection for use are the first conditions to be recognized and attained, but a fair degree of neatness and tasteful appearance has its place on all good railroads.

There are almost no cattle-guards on the line. The crossing-signs are generally of the old type; some are down and most are wholly illegible.

The blocking of frogs, switches, etc., is neglected in a few places.

The bridges are few and generally of the pile structure. The Sheldon bridge across the Missisquoi river, 459 feet long, in three spans, a Howe truss, through bridge, built 23 years ago, has been strengthened since the last inspection by the placing of five-foot arches in every span.

The Thompsonville overhead bridge has been taken down and a grade crossing substituted for the public in its stead. This has been done under some arrangement between the railroad company and the adjoining farm owners.

The Railroad Commission was not consulted and its consent was not given to this change. This new grade crossing exists without legal sanction, unless the same was a private farm crossing.

The depots along this line are suitable for the public convenience and accommodation in general.

The one at North Sheldon is not neatly kept and cleaned out and the smell in the waiting room is disagreeable from lack of decent care in cleaning out or deodorizing the closets.

South Franklin station needs plaster in several places on the walls and ceiling.

The floor is old and badly worn in the Richford station house.

Aside from these criticisms, the station houses are well kept and of good appearance,—that at Enosburg Falls being a model in structure, furnishings and taste of surrounding neatly kept.

The suggestions of the Board to the officials of the road, set forth in the last Biennial Report, have been complied with in part, but not wholly. The lack of means, resulting from the diminution of traffic in the last year, has delayed in some measure the permanent improvements contemplated.

MONTPELIER AND WHITE RIVER RAILROAD.

Line of Road.—From Montpelier to Williamstown, 15 miles with 5.50 miles of sidings. Gauge, standard.

History.—This road was opened to Barre village in 1876, and was extended to Williamstown in 1888, and its continuation to the White river at South Royalton is eventually expected.

Inspections.—October 6th, 1893, by Commissioners Davison and Bagley, accompanied by Messrs. Baldwin, Shanks, Daily and Olmstead; and July 9th, 1894, by Commissioners Pingree and Davison, with Road-Master Shanks, Division Road-Master John Daily, and Jesse O. Olmstead, Foreman of Bridges and Buildings. Edward W. Thompson, Division Superintendent, joined the party at Montpelier.

The roadbed of that portion of this line between Barre Junction and Williamstown, presents the most extensive, expensive, and most needed permanent improvements that have been made on any railroad line of equal length in the State in the last biennial term.

This portion of the road was built with competitive haste, and consequent insufficiency for safe operation. Much of it has stood on cheaply-built trestle and has been subjected to a heavy class of traffic, largely the product of the granite quarries of Barre and Williamstown.

The Board earnestly recommended the filling up of these trestles at the inspection two years ago and reported the full situation to the last Legislature.

It is pleased to report at this session that the causes of apprehension are substantially removed.

Over 4,000 feet of this trestle have been filled into permanent earth roadbed within the present term and the work is still progressing. Road-Master Shanks, under whose general direction the work is being done, assured the Board that within sixty days from the date of this inspection (July 9th, 1894) the old trestle work would disappear under the embankment of the fills.

Renewal of ties is fairly attended to throughout this line. The heavy carloads of rock hauled over it demand ties of full life. They are laid 3,000 to the mile.

The rails are all steel of 60 pounds weight to the yard, from Montpelier to Barre, and thence to Williamstown they are 60 pounds iron for 4 miles of the 6, and the balance of the way are old steel of 60 pounds weight.

The ballast of this road throughout is of excellent quality and is fair in quantity. Indeed, the long fills heretofore and now being made are composed of good ballast material.

The roadbed is much improved, and the bridges—now that the trestles are so generally disposed of, are better as a whole than have ever been found at previous inspections.

The fact should be mentioned that a girder bridge of substantial and, to the Board, novel design has been built at the Ditty trestle for the waterway of the stream. Instead of an arch, rails and iron girders, closely placed, reach from abutment to abutment and are covered with a deep stratum of cement, and then deep ballast is placed over all for roadbed.

Cattle-guards are not in place in every instance required by law, and one or two crossing signs are still lacking. Safety blocking is well kept up, and the surfacing, ditching and general good taste of the road is noted.

The station houses are all excellent and neatly kept.

NEW LONDON NORTHERN RAILROAD.

Line of Road.—From New London, Conn., to Brattleboro, Vt.; 121 miles, of which only 10 miles, South Vernon to Brattleboro, are in Vermont. Sidings, 23.32 miles; 4.20 miles in Vermont. Gauge, standard. Rails, all steel; 58, 60, and 75 pounds to the yard.

History.—This road was leased December 1st, 1871, to the Trustees of the Central Vermont Railroad Company for the term of 20 years, the lessees assuming all responsibilities and paying an annual rental of \$150,000 per year in quarterly instalments, with an additional \$15,000 for every \$100,000 of gross earnings in excess of \$510,000. This road has been leased by the Central Vermont Railroad Company for the term of 99 years from December 1st, 1891.

Inspections.—Made September 13th, 1893, by Commissioners Davison and Bagley, accompanied by Messrs. Baldwin, Shanks and Olmstead; and July 10th, 1894, by Commissioners Pingree and Davison, and Clerk Watson, accompanied by Messrs. Shanks, Olmstead and Beeman. Governor Fuller also joined the Board at South Vernon station.

This 10 mile stretch of line in this State is the northern part of the New London Northern Railroad, over which from Brattleboro, also the Central Vermont system reaches the sound and makes steamship line connection from at New London, Conn., for New York.

The commodious and airy station house at Brattleboro is found to be wanting in attention to water flushing and deodorization in its closets. Perhaps the lack is temporary, but, at a point of so large patronage, the closet facilities should be inspected daily and all needed sanitary precautions provided.

RUTLAND RAILROAD.

Line of Road.—From Bellows Falls to Burlington, 119.7 miles; sidings and other track, 25.30 miles. Rails, steel; 58, 72, 74, and 75 pounds weight. Gauge, standard.

History.—Chartered as the Champlain and Connecticut Railroad Company, November 1st, 1843. Charter modified in 1847, and name changed to Rutland and Burlington Railroad Company. Opened for travel in 1849. It was taken possession of and operated by the trustees of mortgage bonds in November, 1853.

In 1867 the road was re-organized under the name of the Rutland Railroad Company. In December, 1870, it was leased to the management of the Vermont Central Railroad for 20 years from January 1st, 1871, at an agreed annual rental, which lease was subsequently modified and the rental reduced until finally it was agreed that the Central Vermont Railroad Company should pay for the use of this road and the Addison Railroad a minimum yearly rental of \$250,000 and \$8,000 for organization expenses. It is now operated by the Central Vermont Railroad Company, under a new lease for 999 years from December 31st, 1890, at an annual rental of \$345,000.

Inspections.—This division was inspected in 1893 by Commissioners Davison and Bagley, and Clerk Watson, accompanied by Jesse Burdett, Division Superintendent; J. W. Shanks, General Road-Master; and L. E. Roys, Bridge-Master; and July 6th, 1894, by the full Board, accompanied by Messrs. Baldwin, Shanks, Roys, Olmstead and Day, officials of the road.

The line of the Central Vermont from Essex Junction to Burlington was taken up, for convenience, on inspection in connection with the Rutland Division, although it properly belongs to the old Vermont Central line.

Between Essex Junction and Burlington, however, there has been no important change in the physical condition of the road, bridges or stations since last reported except the lateral staying of the easterly one of the two Winooski link and pin bridges.

These two bridges are not of the standard factor of safety for the present weight of traffic, but are provided with excellent floor systems and safety beams, carefully gaged and bolted to the ties.

The station house at Winooski is now complete in its condition except the placing of the flushed closets in the apartments already prepared for them, which is to be done once.

The station at Burlington has been renovated inside with paint and cleaning, and its location on the wrong side of several tracks is the principal inconvenience noticeable here.

The new draw-bridge at the south end of the yard in the city is a great and permanent improvement.

The rails on this division are good throughout, being Scranton steel of 60 pounds weight from Burlington to New Haven Junction, thence to Brandon 75 pounds, and the balance to Bellows Falls of 60 pounds weight.

The station at Charlotte is neglected in its plastered walls, considerable patching and papering being needed. Its platform has been renewed and is in good condition.

At No. 14, dry bridge, the overhead crossing has been dispensed with and a grade crossing established by arrangement between the railroad company and the town authorities, without the consent or approval of the Board, and the grade crossing is now traveled by the public at railroad risk, the change having been made without the proper warrant under the laws of the State.

The station at Ferrisburg is small, old and unchanged.

The Ferrisburg bridge, No. 18, has been materially strengthened by reinforcing the trusses.

The Middlebury bridge, so-called, No. 31, has been rebuilt, being now an iron, riveted lattice. This bridge is believed to be the finest span of iron bridge work in the State and the longest span, being 236 feet. Its cost was \$19,000. Its floor system is of the most approved type, with safety beams 10 x 10 inches, securely girded to every tie and strongly bolted to the timbers.

Flushed water closets and urinals have been introduced into the Rutland station house and the criticism expressed in former Reports upon the filthiness of these accessories is no longer in order.

Not to occupy too much space of this Report in a detailed specification of each bridge, the article in Part I of this Report on the subject of bridges, is referred to as setting forth the progressive work of Bridge-Master Roys of this division in his outlays for the permanent improvement of the bridges under his charge. He has erected 19 new iron bridges to replace old wooden structures, varying from 36 to 236 feet in length, mostly in the last two years, which has brought the standard of bridge construction on this division far towards the front rank of good railroads.

Besides this, Mr. Roys has constructed three new, Howe truss, wooden bridges at a cost of between ten and eleven thousand dollars.

As to the ties, there have been 48,000 renewals placed between Vergennes and Bellows Falls, in the last year.

As to the general condition of the roadbed and track it, can be said, from full knowledge of the facts that the improvements made on this line in the last eight years have exceeded any that the other railroads of the State present.

Its wrought iron rail has been replaced by steel, the roadbed has been raised, the ties have been laid in ballast and ditches have been made for drainage. Worn-out, decayed and lifeless ties have given place to an increased number of new and heavier ones. Sags have disappeared, the alignment has been improved, the fences, cattle-guards, crossing signs, safety guards and warning devices have come into place and are substantial and modern, and several new and commodious station houses have been built, and several of the old ones have been remodeled and made satisfactory to the public.

The Landon crossing in Rutland is not yet closed to public travel.

The Pine street under grade crossing is not yet so far perfected in all the requirements of the orders of the Board therein, so as to be ready for the inspection and acceptance of the Board.

CLARENDON AND PITTSFORD RAILROAD.

Line of Road.—From Proctor to West Rutland and from Proctor to the marble quarries in Pittsford, being 10 miles of main line, with 2.53 miles of spurs and branches and .52 mile of sidings. Also, by leased track, from Center Rutland to Rutland, 1.78 mile additional. Gauge, standard. Rails, steel, weighing 56, 60, 70 and 72 pounds per lineal yard.

History.—The Clarendon and Pittsford Railroad Company was organized September 10th, 1885, under the general laws. Two miles of track were laid in 1886, and eight miles more during the next three years. The Pittsford and Rutland Railroad, also constructed under the general laws, was built in 1890, for the purpose of connecting the Clarendon and Pittsford with the Bennington and Rutland Railway at Rutland, and is operated by the Clarendon and Pittsford Railroad Company, under a lease for the term of 15 years from July 2nd, 1890. The Clarendon and Pittsford connects with the Central Vermont at Center Rutland, and with the Delaware and Hudson Canal Company's road at Center Rutland and West Rutland.

Inspections.—The inspection for 1893 was made September 19th, by Commissioner Davison and Clerk Watson, accompanied by Fletcher D. Proctor, President, and Geo. C. Robinson, Superintendent. The last inspection was made July 19th, 1894, by Commissioner Davison and Clerk Watson, accompanied by President Proctor and E. R. Morse, Treasurer.

Further than extensive widening of the roadbed with large quantities of marble waste and a liberal renewal of ties, no essential changes have been made in this road since the last Biennial Report. The roadbed, bridges, track and rolling stock are particularly designed and constructed for the transportation of immense quantities of heavy marble blocks and for other freight traffic incident to the marble business, no passenger business being handled at present.

The bulk of the freight transported is on account of the Vermont Marble Company, chiefly for whose benefit the road

was built, although freight is accepted from the general public at regular rates. The Vermont Marble Company operates 300 gangs of saws, and produces annually the equivalent of 3,000,000 feet of sawed marble. In its numerous quarries and mills in the immediate vicinity of Rutland, it employs 1,700 men, with a monthly pay-roll of over \$60,000. Its capital is \$3,000,000, and it is the largest marble concern in the world. Through the medium of the Clarendon and Pittsford road, it distributes its enormous output of marble to the several trunk lines which center at Rutland.

It was found at the last inspection of this road, that the cattle-guards and fences contemplated in the agreement executed February 2nd, 1894, by and between the Clarendon and Pittsford Railroad Company and the Delaware and Hudson Canal Company, at a hearing had before the Board, upon complaint of H. G. Sheldon and others, have been placed at the Deland or Boardman Hill crossing in West Rutland, and said cattle-guards and fences are accepted and approved by the Board as being in substantial compliance with said agreement and the understanding of the Board.

DELAWARE AND HUDSON SYSTEM.

SARATOGA DIVISION.

RUTLAND AND WASHINGTON AND RUTLAND AND WHITEHALL RAILROADS.

Line in Vermont.—From Castleton to New York State line, 6.83 miles, and from Rutland to New York State line, near Middle Granville, New York, re-entering Vermont near Pawlet station and leaving the State again between Rupert, Vermont, and Salem, New York, making 36.65 miles of main line in Vermont, and 14.91 miles of sidings.

History.—These lines were originally chartered as the Rutland and Washington, and the Rutland and Whitehall Railroads and were leased to the Rensselaer and Saratoga Rail-

road Company, and after being operated by the latter company for several years, were, on March 1st, 1871, leased to the Delaware and Hudson Canal Company with other roads by which they have since been operated.

Inspections.—Made September 19th, 1893, by Commissioner Davison and Clerk Watson, accompanied by special train crew only; and July 19, 1894, by the same Commissioner and Clerk, accompanied by R. H. Brown, Assistant Engineer.

That portion of this road running from Castleton to Whitehall, follows along the low lands bordering upon Castleton river, rendering cuts and fills of any considerable length and depth unnecessary, and they are not found. The roadway is now in a good state and of sufficient width of top surface to receive and hold the ballast, abundant quantities of which have been applied, and this, together with deep ditches, renders the drainage good, protects the roadbed against frost, and makes the surfacing and policing easy and comparatively inexpensive. The rails are of 60 and 72 pounds weight to the yard, and were found in excellent alignment and comparatively unworn. The ties are laid 3,000 to the mile, and what is rare on any railroad, no decayed or unsound ones were observed on this portion of the road. Especial care is exercised in building and maintaining the fences, which are of the regulation standard, the wings at the highway crossings being painted or whitewashed, and securely placed. This road is divided into sections of five miles each, and each section has six men in the summer and three men in the winter season, and all are under the supervision of a supervisor for every sixty miles of road. This large force, working with diligence, can and do keep this road in all that pertains to the maintaining of roadway and track up to a good standard of excellence. The station houses are apparently of sufficient size for their patronage, but not all of them are kept with commendable neatness, nor are the sanitary conditions what is desirable in all cases.

The want of cleanliness in both waiting rooms and closets in some of these depots has received the censure of the Board

on previous occasions, and it is to be hoped that better care will be given to this important matter hereafter.

The old bridges at Rutland and Castleton, which were of wood, and of doubtful strength, have been replaced by iron ones of standard capacity. All are now of iron of approved design with a seemingly large factor of safety and supported by masonry of undoubted quality.

The same general remarks will apply to that part of this road running from Castleton to Middle Granville, N. Y., and thence on to Eagle Bridge, where it joins the Fitchburg Railroad, except as they relate to its roadbed and track. On this part of the line (the old Rutland and Washington), the roadbed is somewhat narrow at the surface, with high, abrupt shoulders and a deficiency of ballast, while the rails, originally laid on the Rutland and Whitehall Railroad, where they remained in service several years, are some of them considerably worn and flattened at the joints. Otherwise than as above noted, this part of the line is well maintained, and for a road whose business is largely local its physical condition and management is superior to most roads of its class.

FAIR GROUND RAILROAD.

Line of Road.—This road extends from its connection with the Woodstock Railway, about three quarters of a mile north of White River Junction, to the fair grounds of the Connecticut River Valley Association. The length of the main line is .59 mile; sidings, .29 mile.

The track is of standard gauge, and the rails are about one-half new steel and one-half second-hand iron, both kinds weighing 56 pounds to the lineal yard.

History.—The Fair Ground Railway Company organized under the general railroad law, April 3rd, 1890, built its railroad during the following summer, and commenced operating the same September 1st, 1890.

This railroad was built solely for the purpose of transporting fair exhibits, stock, and passengers from White River Junction, in connection with the Woodstock Railway, for the privilege of running over the line of which company it pays a fixed sum per trip, to the fair grounds of the Connecticut River Valley Association where, from time to time, there are horse breeders' exhibitions, races, and fairs, the Vermont State Fair being held here in alternate years.

Inspections.—August, 1893, by Commissioners Pingree and Davison. Also, August 23rd, 1894, by Commissioners Pingree, Davison and Bagley.

This road was built and is open for traffic during State Fairs and other public horse and agricultural exhibits at the Billings Park in Hartford.

The road was well constructed for these purposes, and has been carefully operated on these occasions by the Woodstock Railway, to which it is a spur line.

The ties are laid 2,800 to the mile and are in a good state of renewal.

Ballast is deficient and is of less account than on any other road in the State, as the line remains unused during the season of frost, and undergoes its refitting for train service after the summer opens each year.

It has no passenger station house, but at the fair grounds there are suitable platform facilities in close proximity to the entrance gate and buildings, while its passengers and traffic are received at the Union depot at White River Junction.

There is no bridge on the line except a short stringer over Cæsar brook, which is laid on substantial stone work.

This is one of the few railroad companies of the State that has declared a dividend in the last two years.

It is not fenced, has no highway crossings, and no accident has ever been reported.

FITCHBURG SYSTEM.

WESTERN DIVISION.

Line of Road.—From Massachusetts State line, through the town of Pownal, Vt., to New York State line, 6.49 miles, of which 6.19 miles are double track. Sidings, 1.92 miles. Gauge, standard.

History.—Chartered March 3rd, 1842. Total length of line operated (including main line, branch lines and leased line), 369.08 miles. This road operates the lines formerly owned and operated by the Troy and Boston, and Boston, Hoosac Tunnel and Western Railroad Companies, which were parallel and competing roads.

The Troy and Boston Railroad Company, a New York corporation, was consolidated with the Fitchburg Railroad Company May 3rd, 1887, under the laws of New York and Massachusetts.

The Western Division here treated of, chartered as the Southern Vermont Railroad and owned by the Commonwealth of Massachusetts, was previously leased in perpetuity to the Troy and Boston Railroad Company, aforesaid, at an annual rental of \$12,000, and was that part of the Troy and Boston Railroad lying in this State.

The Boston, Hoosac Tunnel and Western Railroad and its leased line, the Troy, Saratoga and Northern Railroad, were purchased by the Fitchburg Railroad Company, June 1st, 1887, which now owns and operates the two above mentioned lines in this State as double track.

Inspections.—Made September 21st, 1893, by Commissioners Davison and Bagley, and Clerk Watson, accompanied by Train-Master and Acting Superintendent M. P. Snyder, and Division Road-Master J. L. Shanks; and July 20th, 1894, by Commissioner Davison and Clerk Watson, together with the same railway officials as in 1893.

That portion of this road situated in Vermont has been kept up to a high standard ever since it came under the

supervision of this Commission. Its bridges are all of iron, and of standard strength; roadbed broad and well ballasted, ties large, sound and closely spaced, rails heavy and little worn, ditches clean and of sufficient depth to afford ample drainage, regulation fences, and sidings of sufficient length and frequency to accommodate the numerous trains and large freight traffic of this company. These are the characteristics of this road.

The two "link and pin" bridges, No. 102 and No. 103, which were built in 1893, each being a single span bridge of 135 feet in length, are unrivaled in the size and apparent staunchness of all their different members by any bridges of the same type in the State. Latimer re-railing devices are placed at the approaches of all the long bridges, and standard split switches with automatic switch stands are used on the main line. The rails are of 62 and 76 lbs. weight to the yard, and all the heavier ones are fastened at the joints with steel angle bars weighing 42 lbs. each. The stations are not especially attractive, but are kept substantially repaired, and the waiting-rooms and closets are commendably clean. In detail, there are, perhaps, some defects in the roadway, track and bridges of this, as of all other roads that come under the examination of the Board, which its inspections do not disclose, and for the detection of which reliance must necessarily rest upon the ceaseless vigilance of the officials having these matters in charge, but it is the judgment of the Board that this road presents but very few defects that are open to legitimate criticism.

GRAND TRUNK SYSTEM.

ATLANTIC AND ST. LAWRENCE RAILROAD.

Line of Road.—Extends across the northeast corner of Vermont, from Canada line in Norton, to the Connecticut river in Bloomfield, with 30.56 miles of main line and 5.75 miles of sidings in Vermont.

History.—The Atlantic and St. Lawrence Railroad was chartered in Maine, February 10th, 1845.—in New Hampshire, June 30th, 1847,—in Vermont, October 27th, 1848. Construction was commenced July 4th, 1846, and the road was opened from Portland, Maine, to Island Pond, Vt., January 29th, 1853. On August 5th, 1853, the line was leased to the Grand Trunk Railway Company of Canada, for nine hundred and ninety-nine years, the lessee assuming all obligations and guaranteeing six per cent on stock, the authority for the lease being an Act of the Maine Legislature, March 29th, 1852, and an Act of the New Hampshire Legislature, July 12th, 1856.

Inspections.—In 1893, made July 25th. Present, Commissioners Pingree and Davison, and Clerk Watson. Also, J. W. Riddle, Assistant Superintendent; H. B. Hollinshead, Assistant Engineer; C. Woodman, Master of Transportation; and D. Stewart, Division Road-Master. In 1894, made June 29th. Present, the same Commissioners, accompanied by Samuel J. Rigg, Bridge-Master; Charles Woodman, Master of Transportation; and W. B. Causbroke, Chief Clerk.

The original roadbed was most elaborate and unnecessarily expensive. The ballast is thorough and complete in quantity and generally of fair quality. It is deep and broad, going to the bottom of the frost limit most of the way. The sixty-pounds rails of 1872 are being replaced by sixty-seven-pounds stock, from North Stratford to Canada line, at the rate of one and a half to two miles per year.

The ties are in good condition, are laid 2,640 to the mile, and rest solidly from end to end in ballast. The rail ends generally rest on wooden shim blocks of white or English oak. The heavier rails, however, are being laid with the angular fish-plates and iron under-rests.

The bridges are all of iron, except very short ones, and are of the link and pin and girder types. The floor systems are good, the ties on them being hard pine.

The stone masonry of the bridges is generally built in cement, though that of two old bridges is put up dry, and small seams are discernable.